THE MEDICAL JOURNAL OF AUSTRALIA

VOL. II.—28TH YEAR. SYDNEY, SATURDAY, SEPTEMBER 13, 1941. No. 11.

Table of Contents.

[The Whole of the Literary Matter in THE MEDICAL JOURNAL OF AUSTRALIA is Copyright.]

ORIGINAL ARTICLES— Page.
Treatment of Certain Blood Diseases and of Hæmatemesis by Direct Blood Transfusion, by John A. McLean, M.D. .. 281
The Case for Transfusion of Unmodified Blood, by Julian Smith .. 286
The Selection of a Method of Blood Transfusion, by A. C. McEachern, M.B., B.S., F.R.C.S., F.R.A.C.S. 290
Appreciation on Medical Man Power of Western Australia, with Special Reference to Economy of Personnel, by Squadron-Leader N. M. Cuthbert, M.C. .. 293

REVIEWS—
Surgical Pathology .. 298

LEADING ARTICLES—
The Student and the Curriculum .. 299

CURRENT COMMENT—
Cerebro-Spinal Fluid as Substitute for Blood in Transfusion .. 300
Aural Hæmorrhage from a Leaking Carotid Artery 300
Artificial Respiration in Thoracic Surgery .. 301
Gastric Lesions following Head Injuries .. 301

ABSTRACTS FROM MEDICAL LITERATURE—
Ophthalmology .. 302
Oto-Rhino-Laryngology .. 302

BRITISH MEDICAL ASSOCIATION NEWS—
Scientific .. 304
Medico-Political .. 305

MEDICAL SOCIETIES— Page.
Melbourne Pædiatric Society .. 306

PUBLIC HEALTH—
"Britain Keeps Fit" .. 307

CORRESPONDENCE—
A National Medical Service .. 308
Changes in the Lungs in Various Industries .. 309

NAVAL, MILITARY AND AIR FORCE—
Appointments .. 309
Casualties .. 310

MEDICAL WAR RELIEF FUND .. 310

OBITUARY—
Henry William Hackett .. 310
Millice Culpin .. 310
Samuel Percival Lyttle .. 310

NOMINATIONS AND ELECTIONS .. 310

MEDICAL APPOINTMENTS .. 310

BOOKS RECEIVED .. 310

DIARY FOR THE MONTH .. 310

MEDICAL APPOINTMENTS: IMPORTANT NOTICE .. 310

EDITORIAL NOTICES .. 310

TREATMENT OF CERTAIN BLOOD DISEASES AND OF HÆMATEMESIS BY DIRECT BLOOD TRANSFUSION.

By JOHN A. McLEAN, M.D.,

Honorary Physician to Out-Patients, Alfred Hospital, Melbourne.

(From the Baker Medical Research Institute, Alfred Hospital, Melbourne.)

ACCORDING to Boycott's[1] conception of the blood as a living tissue, it would seem that in respect of blood transfusions the direct transfusion of unmodified blood is the ideal method. Thus the time interval is too short to allow cellular change, and moreover there is no anti-coagulant which may initiate changes in the plasma. From an experience of over one hundred direct blood transfusions I have found that two main points emerge. First, a stimulating effect on bone marrow function is obtained by the direct method, and secondly, in the treatment of recurrent hæmorrhage, particularly from peptic ulcer, cessation of bleeding has been obtained in cases in which previous continuous drip transfusion of citrated blood has been ineffectual.

Technique.

At first I used a multiple syringe method, but found that the syringes often became blocked, and thus the quantity of blood injected was less than that required. An article by Riddell[2] on the rotary pump in continuous drip transfusion suggested its use for direct transfusion. Accordingly a pump was made and was first employed in January, 1940, to give a direct blood transfusion. I demonstrated the method to Dr. Julian Smith, who since then has evolved a new type of rotary pump, and with the use of the technique described by him[3] the operation has proved simple and effective.

To facilitate a rapid, reliable flow of blood from the donor I have devised a special needle and cannula. The cannula is of silver; it has an inside bore of one millimetre and a length of four centimetres. It fits inside the lumen of a steel needle two centimetres in length (see Figure I). The needle is inserted into a vein, and as soon as the blood flows the cannula is carefully introduced and, owing to its construction, it extends for a short distance beyond the needle. It is necessary to insert the needle in a distal direction, and a special type of tourniquet is used. This consists of a rubber band, 7·5 centimetres wide, with leather ends, containing rows of eyelets, adapted to fit three pins carried on a metal plate (see Figure II). When applied, this tourniquet lies flat on the arm and can be easily released.

Hæmophilia.

My first direct blood transfusion was given in November, 1938, to a hæmophiliac boy, aged sixteen years, who was suffering from persistent hæmorrhage of the gums following the extraction of three teeth. In a coagulation test of the blood by Wright's method, clotting had not occurred after eighteen minutes at 37° C. The tooth sockets had been plugged and replugged with gauze impregnated with Russell's viper venom, and in addition he was given a continuous drip transfusion of citrated blood. Despite this treatment the bleeding was unabated. He was then given a pint of whole blood by the direct method and there was no further significant hæmorrhage.

Aplastic Anæmia.

The only treatment of primary aplastic anæmia which improves the blood count is blood transfusion. Usually one finds that patients suffering from aplastic anæmia have been given an incorrect diagnosis and have under-

gone a course of treatment with liver and iron, during which period there has been a steady deterioration in the blood condition. Two patients suffering from aplastic anæmia have been treated by direct blood transfusion; one has recovered and the other is still receiving treatment.

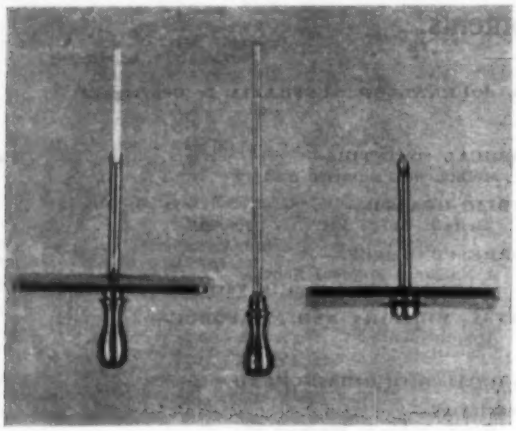

FIGURE I.
Showing silver cannula and steel needle. Dimensions of cannula: inside bore, 1·0 millimetre; length, 4·0 centimetres.

CASE I.—A.H., a man, aged forty-two years, was first examined on June 29, 1939. During the previous six months he had become increasingly weak and dyspnœic. The condition had been diagnosed as pernicious anæmia and the patient had received injections of "Campolon". For some months he had taken several "Chamberlain's Pills" every day for constipation, but he had no symptoms of mercurial poisoning. Physical examination revealed a young-looking man, well nourished, with pronounced facial pallor. A systolic bruit was heard at the mitral area; otherwise no abnormality was detected. A blood examination gave the following information: the hæmoglobin value was 15%; the red cells numbered 800,000 and the white cells 5,000 per cubic millimetre. The relative corpuscular volume was 8·0 cubic centimetres per 100 cubic centimetres. (The normal value is 45 cubic centimetres per 100 cubic centimetres.) The mean corpuscular volume was 100 cubic μ. The mean corpuscular hæmo-

FIGURE II.
Showing tourniquet, consisting of a rubber band with leather ends and a metal plate carrying three pins.

globin content was 24$\gamma\gamma$. Examination of a blood film revealed that the red cells varied in size and shape and an occasional normoblast was seen. A differential leucocyte count revealed that 3·5% were band metamyelocytes, 33% were neutrophile cells, 1·0% were eosinophile cells, 58% were lymphocytes, and 4·5% were monocytes. A bone marrow smear was obtained by sternal puncture; examination revealed diminished cellularity. A differential cell count showed the following distribution: myeloblasts 0·8%, premyelocytes 0·4%, myelocytes 2·8%, eosinophile myelocytes 0·8%, young metamyelocytes 2·4%, band metamyelocytes 8·0%, eosinophile band metamyelocytes 0·4%, neutrophile cells 22·4%, eosinophile cells 1·2%, basophile cells 0·4%, lymphocytes 46·8%, monocytes 3·2%, megaloblasts 0·8%, erythroblasts 4·0% normoblasts 3·2%, Turk cells 0·4%, plasma cells 2·0%. This bone marrow examination reveals depressed hæmatopoiesis; it excludes pernicious anæmia and indicates aplastic anæmia. A fractional test meal examination revealed normal acidity. The Wassermann test produced no reaction. The urine was normal.

Soon after his admission to hospital the patient was given 25 ounces of citrated blood by drip transfusion. There was a febrile reaction and the temperature varied from 100° to 101° F. for three days. During the next two months he was given seven transfusions of citrated blood at intervals varying between seven and twenty-one days, the total quantity given being eight pints. A blood count at the end of this period gave the following information: the hæmoglobin value was 72%, and the red cells numbered 3,200,000 and the white cells 4,000 per cubic millimetre. Details of transfusions and blood counts are shown in Figure III. The patient was sent home from hospital on August 30, 1939, two months after his admission. He rapidly became weaker and more breathless, and three weeks later his hæmoglobin value was 33% and the red cells numbered 1,800,000 per cubic millimetre.

Eighteen days later he was readmitted to hospital and was given three drip transfusions of citrated blood over a period of eight days. Three weeks later his hæmoglobin value was 44% and the red cells numbered 2,100,000 per cubic millimetre. He was then given a direct transfusion of one pint of blood, and one week later examination revealed that the hæmoglobin value was 57%, the red cells numbered 2,500,000 per cubic millimetre and the white cells numbered 4,000 per cubic millimetre. His general condition was improved, and three weeks later he returned home. However, his condition again deteriorated, and he came back to hospital six weeks later. Blood examination revealed that the hæmoglobin value was 40%, and that the red cells numbered 1,300,000 and the white cells 4,600 per cubic millimetre.

During the next seven months he received six direct blood transfusions. His condition improved to a greater extent than after the use of citrated blood; moreover, it was possible to extend the interval between transfusions (see Figure III). The last transfusion was given on August 30, 1940, and since then he has had no further treatment.

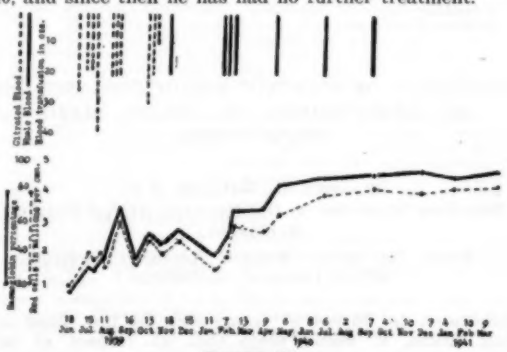

FIGURE III.
Showing hæmoglobin percentage and number of red cells of a patient suffering from aplastic anæmia (Case I) treated by repeated blood transfusion, indirect and direct.

It is convenient to summarize this patient's progress into two periods of approximately seven months. During the first seven months he received eleven pints of citrated blood; but at the end of the period he still remained in a serious state of anæmia. During the second period of seven months he was given six pints of unmodified blood by the direct method; as a result of this treatment his blood rapidly became normal and has remained normal. He is now able to carry on his occupation as a gardener. An interesting feature in the ætiology is the possible effect of mercury, contained in "Chamberlain's Pills", in producing an aplastic condition of the bone marrow. However, there were no symptoms of mercurial poisoning, nor did his anæmic condition improve when the pills were discontinued.

CASE II.—A.D., a woman, aged thirty-five years, was admitted to hospital on June 26, 1940. She complained of increasing weakness and of shortness of breath since an abortion six months previously, which was induced by a

large number of "Beecham's Pills". She had been about two months pregnant, and the abortion was apparently complete. Since then the menstrual loss had been scanty and the periods had occurred at intervals of five or six weeks. She had a previous miscarriage five years earlier, which had been followed by pelvic peritonitis. She had had no other illnesses. Before her admission to hospital she had been treated in the out-patient department by injections of liver extract and by iron given by mouth. However, her condition had become worse.

On examination pronounced facial pallor was noted. A systolic bruit was heard at the mitral area. The gynæcologist reported that no abnormality was found on pelvic examination. The Wassermann test produced no reaction. A fractional test meal examination revealed complete achlorhydria. A blood examination gave the following information: the hæmoglobin value was 28%, and the red cells numbered 960,000 and the white cells 5,000 per cubic millimetre; in the blood film the red cells were fairly well stained and moderately varied in size and shape. The mean corpuscular volume was 105 cubic μ. A differential cell count revealed the following distribution: band metamyelocytes 8·0%, lymphocytes 91·0%, monocytes 1·0%. Examination of a bone marrow smear obtained by sternal puncture revealed pronounced diminution in cellularity, and the differential cell count showed the following distribution: myeloblasts 0·8%, premyelocytes 1·6%, myelocytes 4·0%, young metamyelocytes 10·4%, band metamyelocytes 12·8%, neutrophile cells 12·8%, eosinophile cells 1·6%, basophile cells 0·8%, lymphocytes 50·4%, monocytes 2·4%, erythroblasts 1·6%, normoblasts 0·8%. This examination reveals depressed bone marrow function particularly affecting erythropoiesis.

During the next eight weeks the patient was given six direct blood transfusions and one citrated blood transfusion; the total quantity of blood given was 120 ounces. A blood examination then gave the following information: the hæmoglobin value was 66%, and the red cells numbered 2,900,000 and the white cells 7,500 per cubic millimetre, 11% being neutrophile cells. She returned home, where she gradually became weaker, and she was readmitted into hospital seven weeks later. The deterioration in her blood condition during this period at home can be best described if the fall in hæmoglobin percentage and in the red cell count per week is described as the deterioration rate. The deterioration rate per week for this period of seven weeks was 9% in hæmoglobin value and 0·38 million in red cells per cubic millimetre. A blood examination on her admission to hospital gave the following information: the hæmoglobin value was 21%, and the red cells numbered 1,200,000 and the white cells 7,000 per cubic millimetre; 2·2% were neutrophile cells. During the four days after her readmission to hospital she was given three direct blood transfusions, and a week later a blood count gave the following information: the hæmoglobin value was 72%, and the red cells numbered 3,300,000 and the white cells 10,000 per cubic millimetre; 11·0% were neutrophile cells. Three weeks later examination of a bone marrow smear revealed diminished cellularity. The differential count revealed the following distribution: myeloblasts 0·5%, premyelocytes 2·0%, myelocytes 17·0%, young metamyelocytes 11·0%, band metamyelocytes 19·5%, neutrophile cells 11·0%, eosinophile cells 1·0%, lymphocytes 35·5%, monocytes 0·5%, erythroblasts 1·0%, normoblasts 1·0%. She returned home four weeks after her admission to hospital and remained at home for five weeks; during this period she became weaker and more dyspnœic. The deterioration rate per week for this period was 8·6% in hæmoglobin value and 0·4 million in red cells per cubic millimetre. During the four days after her readmission to hospital she was given two direct blood transfusions, and three days later the hæmoglobin value was 68%, and the red cells numbered 3,200,000 and the white cells 12,000 per cubic millimetre; 19% were neutrophile cells.

After two more transfusions there was further improvement in the blood count and she was sent home five weeks after her readmission to hospital. While she was at home she again became weaker and was worried by throbbing noises in the head. She was readmitted to hospital for the third time four weeks later. During this period at home the deterioration rate per week was 8·0% in hæmoglobin and 0·35 million in red cells per cubic millimetre. On her second readmission to hospital a blood examination revealed that the hæmoglobin value was 40%, and that the red cells numbered 2,100,000 and the white cells 5,000 per cubic millimetre; 4·0% were neutrophile cells. During the next three weeks she received four blood transfusions, and a blood count then showed that the hæmoglobin value was 67% and that the red cells numbered 3,700,000 and the white cells 9,000 per cubic millimetre; 12·0% were neutrophile cells. She was sent home three weeks after this second readmission to hospital and her condition again relapsed. She remained at home for five weeks, and the deterioration rate per week was 7·0% in hæmoglobin value and 0·29 million in red cells per cubic millimetre. During the next three weeks she was given three blood transfusions. Two skin wounds became infected, and apparently because of the cellulitis which developed, the blood count did not improve. Two weeks after these transfusions the hæmoglobin value was 35% and the red cells numbered 1,800,000 per cubic millimetre. She was given two further direct blood transfusions, and the last blood examination, carried out on May 27, 1941, showed that the hæmoglobin value was 58% and that the red cells numbered 2,600,000 per cubic millimetre. Examination of a bone marrow smear revealed an increase in cellularity. The result of the differential count was similar to those of previous counts.

The effect of blood transfusion in improving the hæmoglobin value and the number of red cells is shown graphically in Figure IV. Over the period of eleven

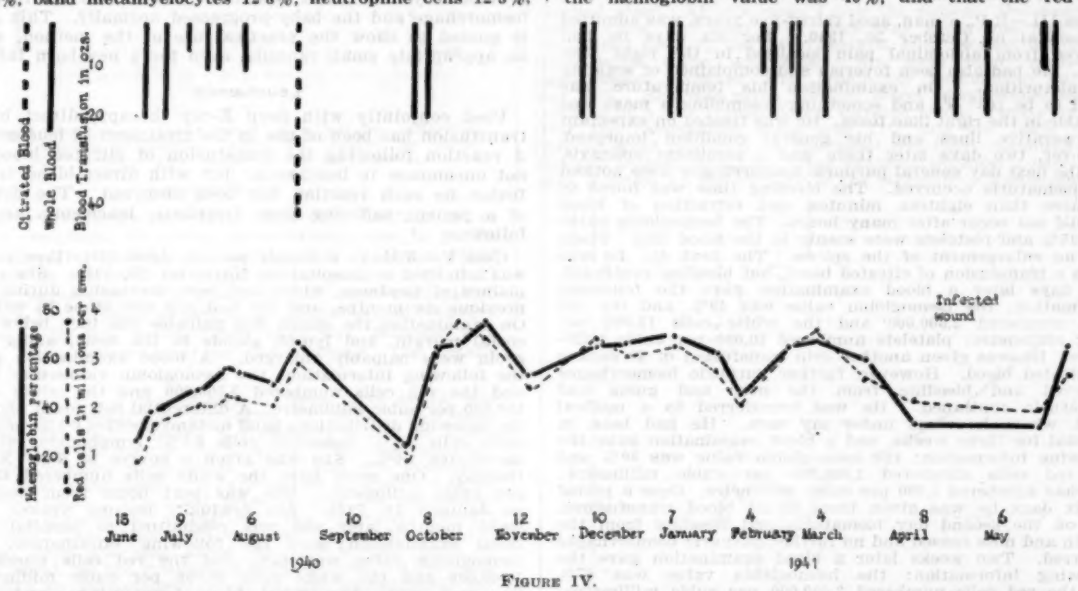

FIGURE IV.

Showing changes in the hæmoglobin percentage and in the red cell count of a patient (Case II) suffering from aplastic anæmia, treated by repeated direct blood transfusions and one transfusion of citrated blood.

months an improvement has occurred in this patient's blood condition, as shown by a steady progressive diminution in the deterioration rate and by an increase in cellularity of the bone marrow. The recovery of the first patient was presumably possible because there were originally a sufficient number of primitive nucleated red cells to initiate by gradual progressive multiplication over a period of many months a return to the normal level of erythropoiesis. In Case II, even after many transfusions, the bone marrow is still aplastic, and life is being maintained in the hope that normal hæmatopoiesis will eventually be restored.

Donors for these two patients have been obtained from among relatives, friends and hospital patients requiring venesection, and also from the Red Cross Blood Transfusion Service.

Acute Purpura Hæmorrhagica.

The immediate treatment of acute *purpura hæmorrhagica* is blood transfusion. The question whether splenectomy is required or not can be considered at leisure. Four patients suffering from acute thrombocytopenic purpura have been treated by direct blood transfusion, and in all cases bleeding ceased after transfusion. Details of two cases are presented.

CASE III.—R.P., a man, aged thirty-five years, was admitted to hospital on October 30, 1940. For six days he had suffered from abdominal pain localized in the right iliac fossa. He had also been feverish and complained of scalding on micturition. On examination his temperature was found to be 103° F., and something resembling a mass was palpable in the right iliac fossa. He was treated on expectant non-operative lines and his general condition improved. However, two days later there was a persistent epistaxis, and the next day general purpuric hæmorrhages were noticed and hæmaturia occurred. The bleeding time was found to be more than eighteen minutes, and retraction of blood clot did not occur after many hours. The hæmoglobin value was 95% and platelets were scanty in the blood film. There was no enlargement of the spleen. The next day he was given a transfusion of citrated blood, but bleeding continued. Ten days later a blood examination gave the following information: the hæmoglobin value was 49%, and the red cells numbered 2,500,000 and the white cells 15,000 per cubic millimetre; platelets numbered 10,000 per cubic millimetre. He was given another drip transfusion of 40 ounces of citrated blood. However, further purpuric hæmorrhages occurred and bleeding from the nose and gums and hæmaturia continued. He was transferred to a medical ward, where he came under my care. He had been in hospital for three weeks, and a blood examination gave the following information: the hæmoglobin value was 30% and the red cells numbered 1,000,000 per cubic millimetre; platelets numbered 2,000 per cubic millimetre. Over a period of six days he was given three direct blood transfusions, and on the second day hæmaturia and bleeding from the mouth and nose ceased and no further purpuric hæmorrhages occurred. Two weeks later a blood examination gave the following information: the hæmoglobin value was 67% and the red cells numbered 3,400,000 per cubic millimetre; platelets numbered 200,000 per cubic millimetre. Subsequently for several weeks he had an intermittent pyrexia. Neither an X-ray examination of the chest and renal tract nor agglutination tests revealed any abnormality. Persistent bacilluria was present. He was then given "M & B 125", one gramme three times a day, and the temperature remained normal until his discharge from hospital on January 25, 1941. Since then he has remained well, and a blood count showed that the hæmoglobin value was 81% and the red cells numbered 4,100,000 per cubic millimetre.

CASE IV.—J.W., a boy, aged six years, was admitted to hospital on April 18, 1941. Ten days previously he had had an attack of acute tonsillitis. A week later he had pulled out a loose tooth, and since then the socket had been bleeding. The day before his admission to hospital his mother noticed bleeding blisters in his mouth and on his lips, and red spots had appeared on his legs. Previously he had had several attacks of tonsillitis, but no other illness.

On examination generalized purpuric hæmorrhages were noted. Both tonsils were enlarged and the right tonsil was bleeding. The socket of a lower incisor tooth was bleeding, and the gums around the right lower molar and premolar teeth were ulcerated and bleeding. There was no enlargement of the spleen. The bleeding time was greatly prolonged, and the platelets numbered 15,000 per cubic millimetre. Bleeding continued in a steady ooze from the mouth, and the child's condition became serious. He was given two direct blood transfusions, each of 10 ounces. No further bleeding occurred and his condition improved. One week after his admission to hospital the hæmoglobin value was 100% and the bleeding time was three and a half minutes. Two weeks later the platelets numbered 400,000 per cubic millimetre and the child was quite well.

To what extent hæmorrhage in acute *purpura hæmorrhagica* is due to deficiency in circulating platelets or to damaged capillary endothelium is not certain; but it is apparent that in the two cases presented cessation of hæmorrhage was due to the transfusion of normal whole blood. In two other cases of acute purpura associated with thrombocytopenia a similar effect was obtained by direct blood transfusion. There is thus a strong probability that the hæmorrhage was arrested by the introduction of normal blood platelets. This conclusion is supported by the observation that the patient in Case III, treated at first with citrated blood in which the platelets were probably agglutinated and therefore ineffectual, was ultimately relieved by direct whole blood transfusion.

Melena Neonatorum.

A baby, aged one day, suffering from hæmatemesis and bleeding *per rectum*, was given a transfusion of five ounces of blood by the direct method. There was no further hæmorrhage and the baby progressed normally. This case is quoted to show the practical use of the method, with an appropriate small cannula, even for a new-born infant.

Leuchæmia.

Used conjointly with deep X-ray therapy, direct blood transfusion has been of use in the treatment of leuchæmia. A reaction following the transfusion of citrated blood is not uncommon in leuchæmia; but with direct blood transfusion no such reaction has been observed. The details of a patient suffering from lymphatic leuchæmia are as follows.

CASE V.—A.McA., a female patient, aged fifty-three years, was admitted to hospital on November 25, 1939. She complained of tiredness, which had been increasing during the previous six months, and she had lost two stone in weight. On examination the spleen was palpable one inch below the costal margin, and lymph glands in the neck, axilla and groin were palpably enlarged. A blood examination gave the following information: the hæmoglobin value was 70%, and the red cells numbered 3,500,000 and the white cells 100,000 per cubic millimetre. A differential cell count showed the following distribution: band metamyelocytes 0·5%, neutrophile cells 4·5%, basophile cells 0·5%, lymphocytes 92·0%, monocytes 1·0%. She was given a course of deep X-ray therapy. One week later the white cells numbered 45,000 per cubic millimetre. She was sent home from hospital on January 10, 1940. She gradually became weaker, and eight months later she was readmitted to hospital. A blood examination gave the following information: the hæmoglobin value was 45%, and the red cells numbered 1,000,000 and the white cells 50,000 per cubic millimetre. She was given two direct blood transfusions, and subsequently a blood count revealed that the hæmoglobin value was 76%, the red cells numbered 3,400,000 per cubic millimetre and the white cells numbered 170,000 per cubic millimetre. She was then given a course of deep X-ray therapy, and the number of white cells was reduced to 63,000 per cubic millimetre. Two months after her admission she returned home from hospital. She gradually became weaker and was readmitted to hospital four months later. A blood examination revealed that the hæmoglobin value was 65%, the red cells numbered 2,800,000 per cubic millimetre, and the white cells numbered 90,000 per cubic millimetre. She was given deep ray therapy and three direct blood transfusions. Blood examination then revealed hæmoglobin value 80%, red cells 4,100,000 per cubic millimetre, white cells 5,000 per cubic millimetre. In a blood film a differential cell count showed the following distribution: neutrophile cells 13%, eosinophile cells 2%, lymphocytes 85%. She felt well and was sent home on April 18, 1941. A month later a blood count showed that the hæmoglobin value was 65%, the red cells numbered 3,300,000 per cubic millimetre, and the white cells numbered 4,000 per cubic millimetre. Details of the blood counts are shown graphically in Figure V.

The aim in giving direct blood transfusion to this patient was to increase the hæmoglobin value and the number of red cells so as to allow an adequate dosage of deep X-ray therapy. An interesting effect of the blood transfusion was that the number of white cells was more than trebled.

This procedure could apparently be utilized in conjunction with the deep X-ray therapy, and the ultimate result of combined X-ray treatment and direct blood transfusion was to reduce the number of white cells to a much greater extent than was otherwise expected. Further investigation along these lines is indicated.

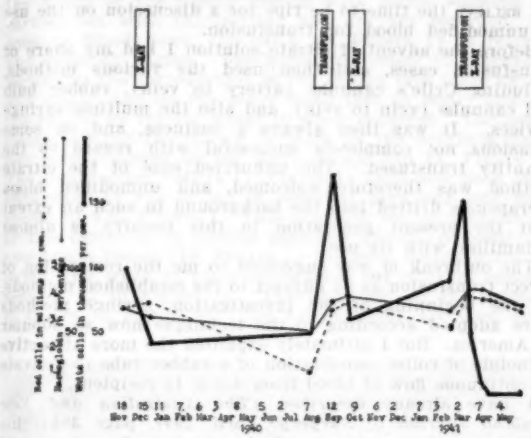
X-RAY
TRANSFUSION
X-RAY
TRANSFUSION
X-RAY
150
100
50
18 15 11 7 6 3 8 5 2 7 12 9 6 2 7 3 2 7 4
Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May
1940
1941

FIGURE V.

Showing changes in blood count of a patient suffering from lymphatic leuchæmia (Case V) treated by deep X-ray therapy and direct blood transfusion.

Hæmatemesis.

There is divergence of opinion regarding the medical or surgical treatment of severe hæmatemesis due to peptic ulcer, but all authorities are agreed that excessive blood loss must be remedied by transfusion. In a series of 17 cases of hæmatemesis in which direct blood transfusion was given, hæmorrhage ceased in all instances and recovery occurred. In this series there were five patients who suffered from severe recurrent hæmorrhage; the details are as follows.

CASE VI.—M.W., a female patient, aged forty years, was admitted to hospital on November 2, 1940. Two days previously she had vomited a chamber-pot full of blood, and afterwards she went to the lavatory, where she collapsed. Later she vomited more blood. She had not previously suffered from indigestion. On examination pronounced facial pallor was noted. The blood pressure was 100 millimetres of mercury systolic and 80 diastolic; the pulse rate was 120 per minute. The hæmoglobin value was 40%. During the next ten days she was given six and a half pints of citrated blood by the continuous drip method. After each transfusion an improvement occurred, but subsequently her condition deteriorated. Ten days after her admission to hospital the hæmoglobin value was 35%, and at this stage I was asked to see her. She was given one pint of unmodified blood by the direct method. The next day the hæmoglobin value was 48% and subsequently a steady rise in the hæmoglobin value and a corresponding improvement in her general condition occurred. Sixteen days later the hæmoglobin value was 95%. The changes in hæmoglobin value and pulse rate are shown in Figure VI. A fractional test meal examination revealed hyperchlorhydria, and an X-ray report after a barium meal was that the appearance of the duodenum was consistent with recent ulceration.

CASE VII.—M.T., a female patient, aged fifty-four years, was admitted to hospital on June 30, 1940. Twelve hours before her admission she vomited a large quantity of blood. She had previously suffered from indigestion. On examination pronounced facial pallor was noted. The blood pressure was 100 millimetres of mercury systolic and 60 diastolic. The pulse rate was 112 per minute and the hæmoglobin value was 45%. No other abnormality was detected. She was given one pint of blood by the direct method and her condition improved. Four days later another hæmatemesis occurred. The hæmoglobin value was 30% and the systolic blood pressure 80 millimetres of mercury. She was given one pint of citrated blood by the continuous drip method without my knowledge. Not much improvement in her general condition occurred, and two days later I gave her another direct blood transfusion. The next day the hæmoglobin value was 45% and two weeks later it was 72%; recovery was uneventful. A fractional test meal examination revealed increased acidity, and an X-ray examination after a barium meal revealed no abnormality in the stomach or duodenum.

CASE VIII.—K.D., a medical student, aged twenty-three years, suffered a severe hæmatemesis on August 2, 1940. The hæmoglobin value was 30%. He was given two pints of citrated blood by the continuous drip method. The next day the hæmoglobin value was 48%. His condition deteriorated, and two days later the hæmoglobin value was 30%. The systolic blood pressure was 100 millimetres of mercury and the pulse rate was 120 per minute. He was given two direct blood transfusions. The next day the hæmoglobin value was 58% and he made a satisfactory recovery. He expressed the opinion that the effect of whole blood was preferable to that of citrated blood.

CASE IX.—C.A., a female patient, aged sixty-one years, was admitted to hospital on December 16, 1940. During the two days before her admission she had vomited about three pints of blood, and the motions were noticed to be black. She had not previously suffered from indigestion. On examination pronounced facial pallor was noted. The blood pressure was 116 millimetres of mercury systolic and 70 diastolic, and the pulse rate was 116 per minute. The hæmoglobin value was 40%. During the next three days she was given three pints of citrated blood by the continuous drip method. During the course of this transfusion she vomited blood. At this stage I saw the patient; the hæmoglobin value was then 35%. She was given one pint of unmodified blood by the direct method, and the next day the hæmoglobin value was 50%. Six days later another hæmatemesis occurred, after which the hæmoglobin value was 35%. She was given another direct blood transfusion followed by a drip transfusion of citrated blood. Twelve days later the hæmoglobin value was 72% and she made an uninterrupted recovery. A fractional test meal examination revealed achlorhydria. An X-ray examination after a barium meal revealed no abnormality in the stomach or duodenum.

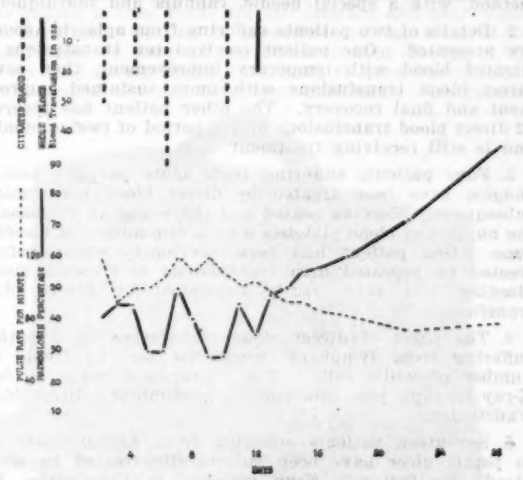

FIGURE VI.

Showing changes in pulse rate and hæmoglobin percentage of a patient suffering from severe hæmatemesis (Case VI) treated by continuous drip blood transfusion and direct blood transfusion.

CASE X.—G.S., a male patient, aged forty-three years, was admitted to hospital on March 27, 1941. He complained of weakness and of vague abdominal pain of several days' duration, followed by sudden collapse. He had noticed the motions to be black. He had suffered from indigestion for years, and two years earlier an X-ray examination revealed a duodenal ulcer. On examination the patient was seen to be a big man, weighing 17 stone, with pronounced facial pallor and cold, clammy skin. The systolic blood pressure was 110 millimetres of mercury and the pulse rate was 120 per minute. The hæmoglobin value was 30%. He was given 24 ounces of blood by direct transfusion. His condition improved, but fifteen hours later he became pale and dyspnœic. The systolic blood pressure was 90 millimetres of mercury and the pulse rate was 140 per minute. The hæmoglobin value was 30%. During the next three days he was given three direct blood transfusions—each approximately 22 ounces. The hæmoglobin value was then 60%, the systolic blood pressure 125 millimetres of mercury, and

the pulse rate 90 per minute. Six days later the hæmoglobin value was 70%, and subsequent progress was uneventful.

Discussion.

Of these five patients, four had received transfusions of citrated blood by the continued drip method and were losing ground, but progressed favourably after direct transfusion of whole blood. The rapid increase in hæmoglobin value in Case VI is noteworthy. An increase of 1% per day is regarded as the approximate normal rate; but in this case the hæmoglobin value increased by 47% in fifteen days after direct transfusion. I am indebted to Dr. Baker, who made all the hæmoglobin estimations in this case.

The fifth patient, a very big man, made little progress after the first direct transfusion of whole blood, but rapidly gained ground after three further transfusions and was able to go home eleven days after his admission to hospital. One would conclude from the results in this small series of cases and from previous experience with transfusion of citrated blood that as a hæmostatic in the treatment of hæmatemesis the direct method is preferable.

In other acute hæmorrhagic conditions a similar satisfactory result has been obtained Patients suffering from severe hæmorrhage due to various causes, such as post-partum hæmorrhage, ectopic gestation, *placenta prævia*, acute menorrhagia, severe epistaxis and excessive rectal hæmorrhage, have been successfully treated by direct blood transfusion

Summary.

1. Direct blood transfusion is given by rotary pump method, with a special needle, cannula and tourniquet.

2. Details of two patients suffering from aplastic anæmia are presented. One patient received ten transfusions of citrated blood with temporary improvement, then seven direct blood transfusions with more sustained improvement and final recovery. The other patient has received 22 direct blood transfusions over a period of twelve months and is still receiving treatment.

3. Four patients suffering from acute *purpura hæmorrhagica* have been treated by direct blood transfusion; subsequently bleeding ceased and there was an increase in the number of blood platelets with a diminution of bleeding time. One patient had been previously unsuccessfully treated by repeated drip transfusions of citrated blood; bleeding was subsequently controlled by direct blood transfusion.

4. The effect of direct blood transfusion on a patient suffering from lymphatic leuchæmia was to treble the number of white cells. The therapeutic value of deep X-ray therapy was enhanced by preliminary direct blood transfusion.

5. Seventeen patients suffering from hæmatemesis due to peptic ulcer have been successfully treated by direct blood transfusion. Four patients in this series had previously been given continuous drip transfusion of citrated blood, which had been ineffectual in controlling hæmorrhage.

Acknowledgements.

I am indebted to members of the honorary medical staff of the Alfred Hospital for access to their cases, to Dr. Julian Smith for stimulating advice and criticism, to Dr. A. B. Corkill, who has placed at my disposal laboratory facilities of the Baker Institute, and to Miss M. Sutherland for assistance with blood counts.

References.

(1) A. E. Boycott: "The Blood as a Tissue; Hypertrophy and Atrophy of Red Corpuscles", *Proceedings of the Royal Society of Medicine*, Volume XXIII, November, 1929, page 15.

(2) V. Riddell: "Blood Transfusion with the Rotary Pump", *The British Medical Journal*, June 3, 1939, page 1125.

(3) Julian Smith, senior: "The Transfusion of Whole Blood", *The Australian and New Zealand Journal of Surgery*, Volume X, Number 4, April, 1941, page 384.

THE CASE FOR TRANSFUSION OF UNMODIFIED BLOOD.

By JULIAN SMITH,
Melbourne.

I BELIEVE the time to be ripe for a discussion on the use of unmodified blood for transfusion.

Before the advent of citrate solution I had my share of transfusion cases, and then used the various methods, including Crile's cannulæ (artery to vein), rubber bulb and cannulæ (vein to vein), and also the multiple syringe devices. It was then always a business, and on some occasions not completely successful with regard to the quantity transfused. The unhurried ease of the citrate method was therefore welcomed, and unmodified blood therapeusis drifted into the background to such an extent that the present generation in this country is almost unfamiliar with its use.

The outbreak of war suggested to me the restoration of direct transfusion as an adjunct to the established methods. At the beginning of the investigation, syringe methods were adopted according to the technique now so popular in America. But I ultimately exploited the more attractive principle of roller compression of a rubber tube to activate a continuous flow of blood from donor to recipient.

I have already described (*The Australian and New Zealand Journal of Surgery*, April, 1941, page 384) this rotary transfusion pump, which will transfuse a pint of blood within the prescribed time of six minutes or thereabouts. The transit time from arm to arm is under ten seconds. The technique set forth in that article remains essentially the same, and the number of cases in which the pump has been used is now well over one hundred.

Some alteration in construction detail of the pump has been necessary because the accessory revolution counters are now unprocurable. The counting mechanism is now designed as part of the machine, but the pump principle, which is very simple, remains unchanged. A top view of the apparatus is shown in Figure I. As the handle turns, the rollers (1, Figure I) attached to it compress the

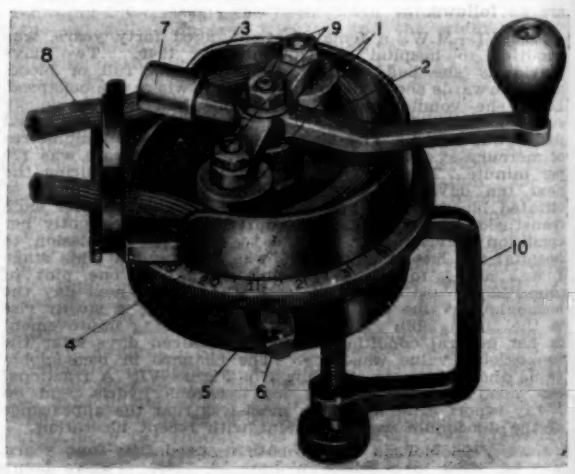

FIGURE I.

tubing (2, Figure I) against the well wall (3, Figure I) and obliterate the lumen serially. A continuous milking action thus takes place, and a steady flow of tube contents is created. I finally chose for this purpose the ordinary red ribbed rubber tubing as used on stethoscopes. It is standard in size and supplies of it are assured. The size of the well is so designed that 10 revolutions cause a flow of one ounce of fluid when this tubing is in use, and therefore 200 revolutions represent a total output of one pint. The counting ring (4, Figure I) makes one revolution in

the same time, and is graduated in ounces from one to twenty. It is activated by the ratchet arm (5, Figure I) operating on 200 teeth set on the under-surface of this ring. The ratchet arm is thrown out of action by the catch (6, Figure I). The ring may be set to zero before the operation, and the revolutions that are necessary for the filling of the tubing system with saline solution are carried out with this setting and are not recorded. So soon as blood flows, the catch (6, Figure I) is released and counting begins. The horizontal roller (7, Figure I) facilitates the introduction of the tubing into place swiftly and easily, and on the other hand just as easily removes the tubing by rolling under it when required. The heavy clamp holding the tubing in place in the previous model has been replaced by the light spring clip (8, Figure I). The compression rollers (1, Figure I) have now been made adjustable by the fitting of eccentric pins and lock nuts, shown at 9 in Figure I. This provides for accommodation to the variation in tubing diameter should it occur. A new bench clamp (10, Figure I) has been designed for the pump, and when in place bears upon the internal bracket, seen at 11 in Figure II. The underside of the machine is shown in Figure II. The ratchet teeth are seen at 12

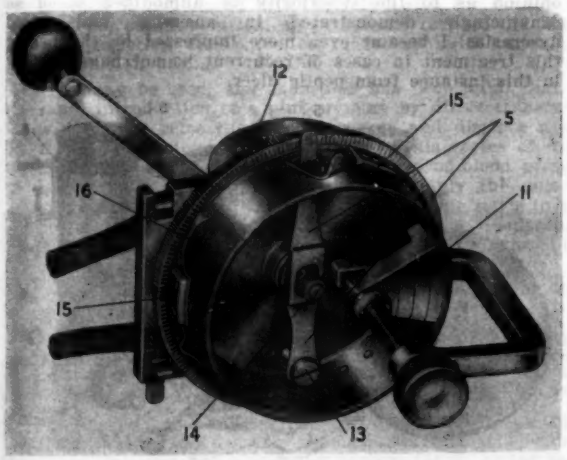

FIGURE II.

in Figure II, and the ratchet arm (5, Figure II) is shown in full length. This is of flattened hard brass fixed on a pivot at 13, Figure II. It thus has a vertical spring action, combined with to-and-fro excursions in a horizontal plane, thereby engaging at the free end tooth after tooth in the ring. Activation of the arm is brought about by the crank pin (14, Figure II), which is mounted eccentrically on the lower end of the main spindle. It is obvious that recording will occur equally well for both clockwise and anti-clockwise turnings of the handle. And in fact either direction will in turn be necessary according to the arm sides of the donor and recipient respectively. Three brackets (15, Figure II) support the ratchet ring against a collar on the body, and a non-return check spring is shown at 16 in Figure II. This holds the counting ring at rest each time the ratchet arm is moving into position to engage the next tooth.

The ground plan of the operation for direct blood transfusion is shown in Figure III. The donor and recipient must recline on tables or beds, which should be of the same height. The arms are drawn somewhat from the side and must be fully extended at the elbows. The bench between measures eighteen inches in length and eight inches in width. It is covered by a towel, and the pump, stop-watch and saline pot are clamped in place over it. The bench rests upon the tables or beds by means of two hinged extension pieces (3, Figure IV), and is adjusted in position with reference to the elbows so as to permit easy curves of the tubing from pump to vein. The choice of arm veins may necessitate a head-to-foot position of donor and recipient; and when a recipient leg vein is used, the table position must be suitably altered. The thick tubing under compression by the rollers is eighteen inches long; and the two pieces of collapsible tubing leading to the arms are each nine inches long. The capacity of the

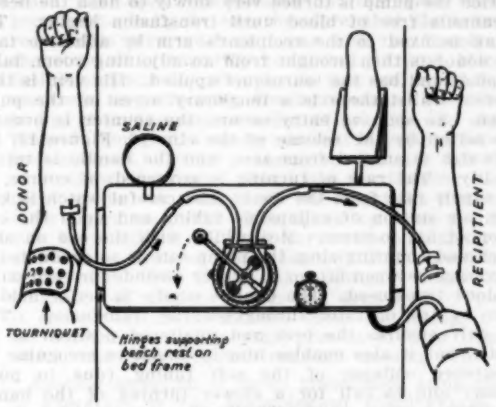

FIGURE III.

tubing system is about one-half ounce, and no paraffin or other protective is used. Virgin tubing must be thoroughly scoured by 5% caustic soda solution followed by water, then by 5% hydrochloric acid solution followed by tap water, and then by distilled water, which is drained away. The tubing is then ready for sterilization and use. Under this treatment clotting is prevented for the term of the transfusion, so long as the blood is kept flowing. The tubing may be repeatedly used until it loses its resilience. It is essential to wash it through thoroughly with running

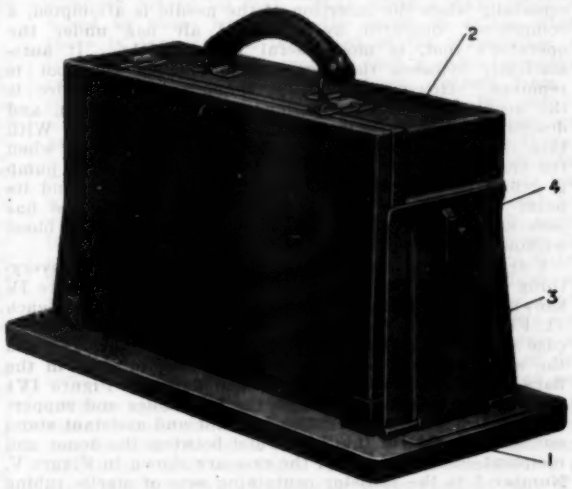

FIGURE IV.

cold water immediately after use. It must be rolled between the fingers in order to expedite cleaning, and a wash with warm soap and water follows. This in turn is thoroughly flushed away, and the tubing is ready again for sterilization. The glassware is prepared by being immersed in chromic acid, which is then thoroughly removed by a flush with water. A small bristle brush by being drawn through is useful in cleansing the rubber tubing; treatment with caustic soda and hydrochloric acid need not be repeated; the glassware, however, should receive a chromic acid bath each time.

The steps of the operation are as follows. The recipient is already in position when the tubing system is introduced

into the pump, as shown (Figure III), and the two ends with the cannulæ in place are immersed in the sterile saline solution, made with freshly distilled water. The pump handle is then turned until the air in the tubing is replaced by the normal saline solution. The recipient's vein is then entered, and with the donor's end still in the solution the pump is turned very slowly to flush the needle or cannula free of blood until transfusion begins. The tubing is fixed to the recipient's arm by adhesive tape. The donor is then brought from an adjoining room, takes his place and has the tourniquet applied. His vein is then entered, whilst there is a temporary arrest of the pump action. So soon as entry occurs, the counter is brought into action by the release of the clip (6, Figure I), the stopwatch is started from zero, and the handle is turned steadily. The rate of turning is governed, of course, by the supply rate from the donor, and careful watch is kept upon his section of collapsible tubing and upon the condition of his forearm. Meanwhile, with the eye on stopwatch and counting ring, the pump rate is so graduated as to average between fifteen to twenty seconds for each ounce of blood transfused. The donor's needle is better held in place by the operator throughout the transfusion. This not only ensures the best and unaltered position of the needle, but it also enables him by touch to recognize the threatened collapse of the soft tubing (due to pump action) and to call for a slower turning of the handle should it be necessary. This is important and must be rigidly observed.

Some points about apparatus deserve mention. The donor's arm compressor has taken two forms. In one, the principle of the inflated rubber bag in use clinically for blood pressure estimation has been modified by reduction in its width to two inches. But, as even this has at times prevented a good line of approach to the veins, we have devised a combination of a flat rubber band with leather extensions, holed with eyelets, that has proved quite good. The air-operated compressor for the donor seems now unnecessary. For the better display of the recipient's vein, especially when the insertion of the needle is attempted, a compressor, operated by a second air bag under the operator's foot, is most useful (Figure III). It automatically releases the arm pressure when the foot is removed. However, the most important new device is the needle-cannula combination adopted by McLean, and described in his article in this issue (page ***). With this, the vein is entered by the needle as usual, and when the blood flows, the cannula already attached to the pump is gently pushed right through the needle and beyond its point well into the vein lumen. Since this method has been adopted there has always been a ready flow of blood without stoppage or undue delay.

I draw attention to a portable outfit that contains everything necessary for a direct blood transfusion. Figure IV shows the apparatus packed for transport. The bench (1, Figure IV) is seen attached upside down to the metal case (2, Figure IV) by the hinged flaps (3, Figure IV) and the spring clips (4, Figure IV) engaging in slots in the flaps (3, Figure IV). These hinged flaps (3, Figure IV) rest, as has been described, on the two tables and support the bench between them. The operator and assistant stand one on each side of this bench and between the donor and recipient. The contents of the case are shown in Figure V. Number 1 is the canister containing sets of sterile tubing ready for use in the pump, which itself is shown at 2 in Figure V with the clamp at 3 in Figure V. The stopwatch in its case and its bench clamp are shown at 4 in Figure V, and two saline solution containers (5, Figure V) with specially designed airtight metal caps are seen resting on the closed case, one being in the saline solution pot (6, Figure V) with its bench clamp showing. The open metal box between them contains a cutting down set of instruments in a roll ready for use, also some local anæsthetic agent and a bottle of antiseptic solution, dressings and bandages. The case and bench are entirely of metal, and the complete outfit, including filled saline solution jars, weighs 20 pounds and contains everything required for a transfusion; it has been used frequently in the patient's home. Moreover, this ready-for-use arrangement saves delay in the ward or in the operating theatre. It will be seen that neither the pump itself nor the saline solution pot need be sterilized, for in this case one of the sterile saline solution jars with its cap removed rests in the saline solution pot, and the sterile tubing set is taken from its sterile canister and introduced into the pump by an assistant whilst the operator holds the ends and then puts them in the saline solution. In the operating theatre the saline solution pot is sterilized and the theatre supply of saline solution is poured into it, the portable saline solution jars being kept in reserve.

I began this work about two years ago with the idea of providing, if possible, a really practical and easy method of direct transfusion as an accessory to established practice, especially in a time of national stress, the result of war and the probable overload on blood banks and standard apparatus. It was my good fortune to become associated quite early in the piece with Dr. John McLean, who was interested in the matter more from the viewpoint of hæmatology. I was thereby afforded a wealth of cases, with opportunities for development of pump design. Naturally, at the same time, I was able to observe the results of unmodified blood transfusion in many of these cases. And although it was interesting to see the accepted opinion as to the superiority of unmodified blood so convincingly demonstrated in anæmias and blood dyscrasias, I became even more impressed by the use of this treatment in cases of recurrent hæmorrhage—chiefly in this instance from peptic ulcer.

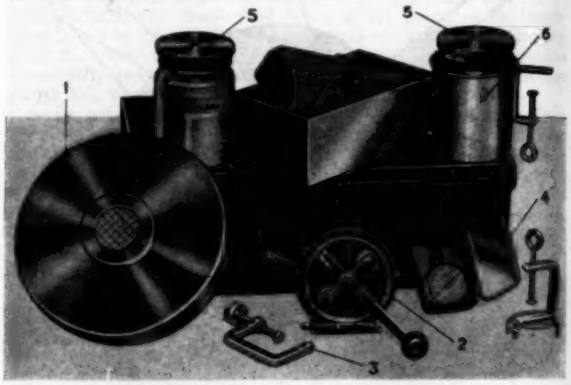

FIGURE V.

Now although the series is too short to permit of a reliable deduction, I have a conviction that the method is full of promise. In nearly every instance in which unmodified blood was used alone, hæmorrhage ceased after a single transfusion, and in no case was the massive method necessary. Moreover, in the cases in which bleeding continued after citrated blood was repeatedly used, the resort to unmodified blood was successful in arresting the hæmorrhage.

Now, why is it that some peptic ulcers bleed and others do not? Is the explanation entirely anatomical? Or has the blood of the patients whose ulcers bleed a slow clotting time and a low platelet count? There is room here for an inquiry, because if this is so, then unmodified blood should certainly be used and citrate solution should be avoided. It has been said, however, that citrated blood increases clotting power by the disruption of platelets and the liberation of thrombokinase. The effect, however, is apparently short-lived, and in cases in which massive citrate transfusions are used, it is probably followed by poor clotting power, as is suggested by the petechiæ sometimes seen in the patients so treated.

Enough clinical observation is now available to show that a percentage of patients with grave bleeding ulcers who would otherwise die can be saved by the persistent transfusion of pint after pint of citrated blood. It is also certain that some of them die from hæmorrhage despite

this treatment; and I submit that some evidence exists that unmodified blood would be preferable in these cases. In the immediately desperate cases, in which perforations in one or other of the larger arteries are present, the question of surgical aid arises. If this is to be efficient, it must be given early—that is to say, within the first day or two, and certainly before the general condition of the patient and his ability to withstand what will probably be a major surgical procedure have been seriously impaired by some days of severe anæmia. Such patients will certainly require massive transfusions, and should receive unmodified blood. There is always a hope, and I consider it is greater with unmodified blood, that the perforation may be plugged by adherent clot, if sufficient blood is given to maintain life while it is forming. Moreover, if operation does take place, it will be on tissues that have not been flooded with a large quantity of citrate solution in a relatively short period. Such a flooding is likely to lead to delay in healing and to the dreaded post-operative lung congestion.

It should be noted that when a second transfusion from a fresh donor is urgently necessary, it may be given through the same vein opening in the recipient if a new tubing set is substituted in the pump and the fresh cannula is introduced into the vein; with the donor's end in fresh saline solution, an occasional turn of the handle will maintain the parts in readiness until the second transfusion begins.

It may be said, and indeed it has been said, that the rapid introduction of a pint or more by direct transfusion will unduly raise the blood pressure and displace a clot. But, from systematic observation in this series of direct transfusions, I have found that no rise of blood pressure occurs above a very low normal; certainly the pulse in grave cases increases in volume and the rate tends to slow down, but the theoretical objection of clot displacement must be swept aside by the urgency of the other considerations.

Perhaps a case of my own will give point to these contentions.

A man, aged fifty years, came under my care in a desperate condition from recurrent rectal hæmorrhage extending over a period of ten days and coming on after injection treatment for hæmorrhoids. His hæmoglobin value was about 20% and he was semiconscious. He was immediately given a transfusion of 25 ounces of unmodified blood, and on the next day was given a further 25 ounces. Much stale clot was apparently present far up in the colon, and as he recovered consciousness this was expelled. There was undoubtedly some bright blood with this stale clot, so that oozing did occur after the first transfusion, but not again at all. On the fourth day after his admission to hospital he was given a further 25 ounces of blood, making a total of 75 ounces of unmodified blood transfused. His hæmoglobin value a week later was found to be 70%. He left hospital in a month, the delay being due to a complicating cystitis, with some rise in temperature. Two months later his hæmoglobin value was 95%.

I am aware of a similar case in which a large number of pints of citrated blood was given, and in which the patient succumbed.

To mention two such cases as proving anything is, of course, not rational; but it leads to the question as to whether whole blood transfusion should not be regarded as the method of choice in the treatment of recurrent hæmorrhage, or in hæmorrhage likely to become recurrent.

One important point requiring attention is the difficulty of the technique, and opinions about this come from two sources—those who have seen the pump in action and those who have not. At least two dozen surgeons and physicians in Melbourne, besides a large number of juniors, have seen the pump in successful operation. There has been from them universal approval as to its simplicity, but some difference of opinion as to the difficulties and also the disadvantages of this method of transfusion. I consider that no part of the performance is intricate or complicated. The arrangement of the patients and their chosen arms, the position of the bench between them, and the disposition of the pump, stopwatch and saline solution pot on it require very little study and practice. The ready introduction of the tubing into the pump is soon learned; the cutting down on the recipient vein and introduction of the cannula are normal routine procedure; and the only moment of tension is the successful introduction of the needle into the donor's vein. Even this difficulty vanishes when the open introduction of the glass cannula is permitted. It is obvious, therefore, that the manual skill required is very much on a par with that involved by all the steps of a smoothly conducted citrated blood transfusion, and any one who can do this well could be equally successful in performing direct transfusion with the rotary pump, given the same amount of practice and experience. There is, however, a strong contrast in pattern between the two methods. Direct transfusion assumes the character of a minor operation. There is a marshalling in the one place, at the one time, of all the essentials, just as in any other operation. The time taken up with preliminaries may be imagined, and will vary with circumstances, and may be put down at under an hour if the blood matching is included. But the actual transfusion takes about six minutes, and then it is over and done with. The patient is spared the inconvenience, often disturbing, I find, of the continuous and lengthy process of drip transfusion, which, moreover, requires constant nursing supervision.

Another objection to direct transfusion often mentioned in literature is the psychological disadvantage due to proximity of donor and recipient. In over a hundred cases I have never seen it. The recipient is either too ill to take an interest in his surroundings, or is willing to submit for his own great good to the conditions imposed, and need not, and often does not, see the donor who, on the other hand, need not see the recipient. The seasoned service donors have been amazingly good and have shown great interest in the method. The donors taken from amongst friends and relatives have also been uniformly good. Their zeal to help has always carried them easily through a strange experience, in which proximity to a stranger played no part. Then again I have often been asked by those witnessing the pump in action whether there is danger from the speed of the transfusion (the transfusion of a pint or more in such a short interval). I can say that no patient has shown distress from this cause. For this consideration the cases fall into two classes. The first includes all those of more or less severe hæmorrhage, of short duration, in which there is presumably an appreciable fall in the total blood volume. Nothing untoward has occurred in any of these, nor was it to be expected. In the cases in which the total blood volume was presumably not reduced very much, such as those of chronic anæmia, blood dyscrasias and so on, there was a surprising absence of cardiac or pulmonary distress. The commonest effect was a feeling of general flush, most noticeable in the face. It should be said, however, that no case of heart or of renal disease was included in the series. None of the patients showed any reaction whatever as a result of transfusion. A careful matching test of donor corpuscles with recipient serum was always carried out.

Then again the possibility has been mentioned that embolus may occur in direct transfusion. Though this complication has been carefully looked for in this series, no evidence of it was found. It should be remembered that the end of the recipient cannula is the smallest part of the circuit. In the occasional case in which a rather long transfusion time proved necessary and a clot slowly formed along the circuit, any attempt it made to escape through the small cannula end was followed by blockage and an immediate dislodgement of the glass union.

In conclusion, I should like to say that during the last thirty years I have tried all the gadgets suggested for direct transfusion, and I consider that the apparatus, here set forth, is incomparably the best. I consider it foolproof, and if the occasional pitfalls associated with veins can be avoided, it will prove uniformly successful in experienced hands. It will, however, be useless to fumblers. During the last two years it has permitted me to observe in McLean's work the uses of unmodified blood in hæmatology,

and I consider that no man devoting his time to this class of work should be without the pump. It becomes an essential tool.

When I began this work, however, I did not expect to encounter what appears to be the apparent superiority of unmodified blood in cases of recurrent hæmorrhage. Direct proof of this can be arrived at only by the study of three parallel series of cases, of bleeding peptic ulcer for instance, running in to numbers of, say, three figures for each. The three series would comprise, first, expectant treatment without transfusion, then citrated blood transfusion, and last unmodified blood transfusion. No doubt the expert statistician would ask for additional factors bearing on age, sex, site and duration of ulcer, clotting and bleeding time, and so forth. In any case I suspect the investigation could not be brought to finality, as it would be in animals, because the worker would probably find himself tending to divert his actions from the role of the pure scientist to the instinctive and humane role of the healer under the influence of the most promising line of treatment.

In discussing this matter recently with Dr. Rowden White, I learned that after many years of study of these cases he had abandoned transfusion of citrated blood because he found it did not arrest the hæmorrhage. He has therefore become an advocate of expectant treatment, coupled with the generous use of morphine. As events fell, a patient with recurrent hæmorrhage from peptic ulcer was then in his clinic at Saint Vincent's Hospital, and was causing him concern. The rationality of unmodified blood transfusion appealed to him, and at his request I gave a transfusion immediately to this patient, whose hæmoglobin value was about 30%. Hæmorrhage ceased, and in one week the hæmoglobin value had reached 50%. Doubt was expressed about the risk of a further transfusion, but I urged that this should be carried out, and was allowed to give it. A week later the hæmoglobin value was 70%, and the patient, being well enough, left hospital several weeks in advance of the expected time. "Beginner's luck", the reader may say. Let me therefore quote Dr. Leslie Hurley, who in a recent personal communication stated that he had tried massive transfusion of citrated blood by drip in numerous grave cases at the Royal Melbourne Hospital and elsewhere. This experience led him to believe that if good did not accrue after a dosage in the region of about five pints, to continue with more transfusion of citrated blood was to increase the tendency to hæmorrhage. I drew his attention to the possible value of unmodified blood in these cases, and again, as events fell, he was soon called in consultation in a case of grave hæmatemesis, probably due to ulcer, in which 95 ounces of citrated blood had been given by the drip method. The patient was not faring well. I was therefore asked to give a transfusion of a pint of unmodified blood, and did so. There was so prompt an improvement leading to a very satisfactory convalescence that the medical men in attendance regarded it as being undoubtedly due to the unmodified blood transfusion.

Dr. William Newton also permits me to quote his experiences in the treatment of hæmorrhaging ulcer. I find that he is the pioneer in this method of treatment, and became a convert after watching the successful result in a very grave case under his care at the Alfred Hospital. His opinion at the present time is that unmodified blood is a hæmostatic in these cases, and that when possible it should be used in preference to citrated blood.

These opinions and experiences, coupled with those of Dr. McLean and myself, would seem to suggest a wider adoption of unmodified blood transfusion in the type of cases mentioned. Furthermore, when unmodified blood can be given safely and easily, as I have shown is now the case, may I put forward a plea for its use also in other cases? Among these may be mentioned the protracted infections including chronic colitis and also those cases of delayed recovery from medical and surgical illnesses, in which chronic invalidism is threatened. In the latter, apart from a moderate degree of anæmia, no abnormality can be detected, and new and good supplies (quite apart from hæmoglobin) of antibodies and of unspoiled white corpuscles are essential.

THE SELECTION OF A METHOD OF BLOOD TRANSFUSION.

By A. C. McEACHERN, M.B., B.S. (Adelaide), F.R.C.S. (Edinburgh), F.R.C.S. (England), F.R.A.C.S.,

Tutor in Surgery and Applied Anatomy, University of Adelaide.

THE present seems an opportune time to survey certain considerations which arise when a method of blood transfusion is being selected. The number of available methods is now legion, and among them are efficient procedures requiring elaborate and expensive apparatus, while there are also inexpensive and inefficient methods needing no special apparatus at all.

The writer's only excuse for venturing upon much well-trodden ground is that his present views have at any rate the virtue of slow emergence from a varied experience over the last eleven years, embracing chronologically the tube and funnel, the Rotanda syringe,[1] the 600 cubic centimetre Macintosh syringe,[2] defibrinated blood,[3] Keyne's flask,[4] Denis Browne's modification of the Macintosh syringe,[5] a simple two-way tap, proprietary vacuum-sealed flasks[6] and other gravity methods,[7] and more recently a rotary pump.[8]

It is quite apparent that great changes will take place in technique in the near future, owing to the need for storage and through the use of dried serum. The experience of military surgeons with the Australian Army pattern apparatus will also no doubt influence development, and later it seems likely that the demand for more elaborate apparatus suitable for all types of use will so lower manufacturing costs as to render feasible its general use.

The possible future universal adoption of a standard apparatus makes it necessary to discuss minor technical difficulties *pari passu* with evolution, because transfusion is a procedure which, while simple in principle, can be made laborious, uncertain and even dangerous by quite small variations in method.

Aspects of Blood Transfusion in Private Practice.

In Australia the private practitioner must be prepared to carry out blood transfusion in either well-equipped or poorly equipped private hospitals or sometimes in a private house. In each case he will provide his own apparatus and must be prepared upon occasions to work with a staff not quite familiar with blood transfusion procedure. Private practice also has its own problems when the question of the preparation and sterilization of equipment is considered. It follows from the conditions outlined that a method is required which is reasonably simple, which makes no undue demands upon operator or staff, which fulfils the modern requirements of easy cleansing and sterilization, and which is readily available. Continuous drip methods have come to stay, and of necessity have to be managed by the nursing staff. The claim of the commercially prepared vacuum flasks for use under these conditions is unassailable. They are already widely used in North America and England, and more recently in Australia, and do not require detailed consideration.

For simplicity it is essential that the citrate solution should be supplied in the flask, permanent sterility being ensured by sterilization *in vacuo*. It is not universally appreciated that solutions sterilized under ordinary conditions in an autoclave remain sterile for only a limited time, and resterilization is fraught with the risk of pyrexial reactions from the proteins of killed bacteria.[9]

The Collection of Blood in Proprietary Flasks.

Several types of flask are available in Australia, and of these the two most generally useful are the two-hole or so-called gravity type, and the three-hole or so-called negative pressure type.

The Two-Hole Type of Flask and the Bonnin Plug.

The fixed stopper of the two-hole flask is provided with a long air tube and a second hole for filling and emptying. This flask contains citrate solution, and for the collection of blood by gravity requires a metal filling plug, which incorporates an air exit vent 0·8 millimetre in diameter, as designed and recently fully described by Bonnin, of Adelaide.[10] This is an excellent arrangement that has given good service, in spite of two slight disadvantages. The air vent in the plug is of necessity small, and, when the blood flow is free it has an obstructive effect, which raises the blood level in the glass air tube by as much as two centimetres. When the flask is inverted to fill the collecting tube with citrate solution before collection of the blood some of the solution is apt to remain in the air vent or a splash of blood may do likewise. The surface tension of the moisture in the narrow vent has an impeding effect equivalent to a further two centimetres or thereabouts of blood, shown by the level in the air tube. The total obstructive pressure of approximately four centimetres of blood might be quite sufficient to stop the flow of blood completely if it had been at all sluggish.

In actual practice the obstructive pressure is overcome if the donor alternately clenches and relaxes his hand.

The Bonnin Plug Adapted for Negative Pressure.

The adaptability of the Bonnin plug can be increased satisfactorily and its minor defects overcome if the plug is adapted for the use of negative pressure. This can be simply done by extension of the air vent so that a sterile air filter and a reversed Higginson's syringe can be attached (Figure I). The Bonnin plug usually works

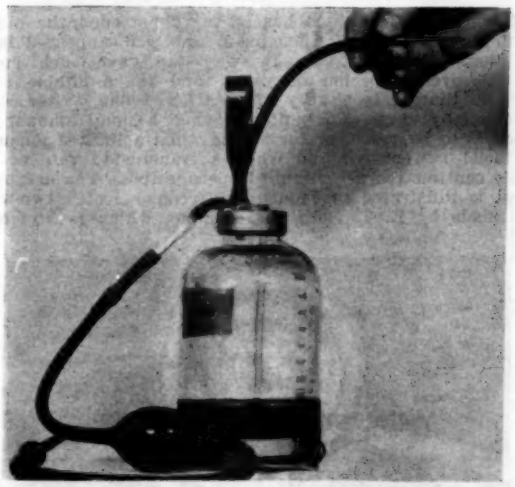

FIGURE I.
Two-hole flask with Bonnin plug adapted for negative pressure and small plug for occlusion of air tube.

quite well by gravity, and in order not to sacrifice its advantages in this respect, a two-millimetre hole is drilled in the wall of the vent extension, which can be left patent if desired while the Higginson's bulb is attached. If the flow slackens, the rubber connexion is pushed further on to the vent extension in order to occlude the two-millimetre hole, and the collection of blood is continued under negative pressure. Occlusion of the glass air tube is of course necessary, and a plug can readily be made from a small bone collar stud with the head cut off and a quarter of an inch of fine rubber tubing fitted on it. For convenience the plug is kept permanently attached to the air filter by a piece of silk.

The writer holds no special brief for negative pressure as such, but he believes that this modification of the Bonnin plug provides a degree of simplicity, efficiency and adaptability not attained by either of the two current methods as supplied commercially, and overcomes the need for two types of flask.

The Three-Hole Type of Flask.

To the third hole of the three-hole type of flask a rubber bulb is attached to provide negative pressure. Negative pressure is required to transfer the citrate solution from an ampoule into the flask, and also during collection. Occlusion of the long air tube is necessary during collection, and occlusion of the filling orifice is necessary during delivery. This type of flask probably enjoys the most extensive use, mainly because of the popular demand for negative pressure, which is said to permit the use of a smaller bore French's needle. It is certain, however, that negative pressure is no corrective for inept venepuncture. The following important disadvantages apply to this apparatus: (i) citrate solution has to be transferred from an ampoule, (ii) the attachment for negative pressure is a little cumbrous (and if the rubber in the stopper is too hard it may refuse to "attach"), (iii) the glass filling tube with perhaps some attached clot is left in position during transfusion to occlude the filling hole, and (iv) the removal of the glass filling tube is frequently dangerously difficult or impossible.

The Administration of Blood.

The assemblage used is shown in Figure II and is applicable to whatever type of flask or bottle is used. The writer has a predilection for having a flask of 4% glucose and N/5 saline solution attached by an easily cleaned metal Y-junction; but this is optional. Saline solution is a convenience in filling the system at the outset and in utilizing the last portion of blood in the tubing to prevent waste. It is of course needed for subsequent infusion of saline solution in many surgical cases. The Y-junction slightly increases the difficulty of freeing the tubing from air bubbles. A solution of glucose (4%) and N/5 saline solution is convenient for general use because it is isotonic with blood, and while providing glucose is presumably less irritant to the vein than slightly hypertonic solutions. Large amounts can be given without the risk that œdema will be caused by increase in the blood chloride content.[10][11] The presence of glucose enhances the stability of the red cells,[12] and this permits concomitant administration and admixture of saline solution and blood if it is thought desirable. The home-made type of drip tube, consisting of the barrel of a glass irrigating syringe, a rubber stopper and a tapered dripper, is used in preference to the closed, one-piece, all-glass drip tube. Adjustment of the level in the former is easily carried out by the application of first principles, but in the latter it requires various tricks which are not invariably satisfactory. For example, to depress the level in the all-glass drip tube inversion of the whole flask is necessary, and froth formation in the dripper is sometimes a considerable annoyance.

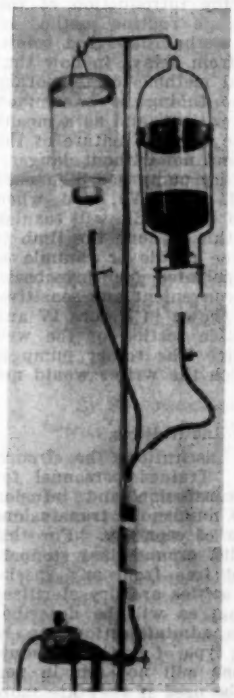

FIGURE II.
Assemblage for administration of blood or saline solution with either proprietary flasks or litre bottles, with rotary pump as a drip regulator, all attached to stand clamped to bed.

Red rubber tubing (number 10 Dunlop) is used; it is easily cleaned, survives repeated autoclaving and withstands moderate pressure.

The two flasks are suspended on a portable stand, which clamps on the bed, and is supplied by A. M. Bickford and Sons, Limited, of Adelaide. (A similar stand is clamped to the head of the bed when concomitant duodenal suction is required.)

According to the circumstances, a serum needle or a glass cannula is used; but whenever possible cutting down on the patient's vein should be avoided. There are occasions, however, in which it is desirable. When multiple transfusions are likely to be needed, as in certain primary blood states, it may be better to cut down on small veins in distal parts of the limbs, using very fine cannulæ, rather than to use a needle in the larger veins, which are thus kept in reserve. When difficulty is experienced in finding small veins, a blood pressure apparatus inflated to a point just above the diastolic pressure will often enable invisible veins to be discovered by palpation and marked with a needle scratch. To lessen the risk of displacement of the needle by movement, veins over joints are avoided when possible.

The Riddell Rotary Pump as a Drip Regulator.

Ordinarily gravity is all that is needed or desirable to regulate the drip; but when small needles and small cannulæ are used or for patients suffering from shock or for infants, sometimes a delay in flow will occur and will be shown by slowing of the rate of drip and rising of the level in the drip tube. Before the introduction of the continuous drip method the writer's routine method of transfusion was the two-way tap method described below, and this was so completely free from delays in flow that he naturally turned to mechanical methods of temporary augmentation. "Milking" of the tubing is a common practice, but is distressing to the patient, and as a means of obtaining information as to the site and nature of the delay it is crude and inaccurate and not without danger.

For nearly a year a Riddell rotary pump has been used as a drip regulator (Figures II and IV), and when necessary a single slow rotation of the handle will furnish the needed *vis a tergo*. Before this is done the limb is checked for constricting bands, the needle or cannula is gently moved, and the vein is palpated for thrombosis. As a drip regulator the pump is convenient and sensitive. The handle is set in the position shown in Figure IV and the thumbscrew controls a movable section of the well and so regulates the rate of drip. The rotary pump is admittedly a luxury, but one which the writer would not willingly forgo.

Blood Transfusion in Institutions.

In blood transfusions given in institutions the circumstances are somewhat different. Trained personnel for the preparation and care of transfusion and infusion equipment are available, and the number of transfusions given accentuates the importance of economy. For this purpose standard litre bottles with ground-glass stoppers have been found economical and free from any special difficulties. For transfusion the bottles are dry sterilized after adequate chemical cleansing, as will be described later, and fluids for intravenous administration can be prepared and stored in the same type of bottle. It must be emphasized that such solutions will not remain permanently sterile and should not be used if they are more than a month old; nor should they be resterilized.

For the collection of blood a French's needle with a suitable length of rubber tubing is used, and the citrate solution is obtained from a sterilized ampoule by shaking the contents into the bottle (Figure III).

For delivery a rubber stopper fitted with a short glass delivery tube and a long air inlet tube is inserted into the bottle. Various methods of suspension in the inverted position have been used, but the one which has proved most reliable is shown in Figure II and was made for the writer by Smith and Company, of Adelaide. It consists of a shallow metal tray for the base of the bottle, and this is fitted with two side-bars with an adjustable cross-piece for holding the cork in place. Also attached to the metal tray is a handle for suspension. Otherwise the method of delivery is as described for the commercial flasks.

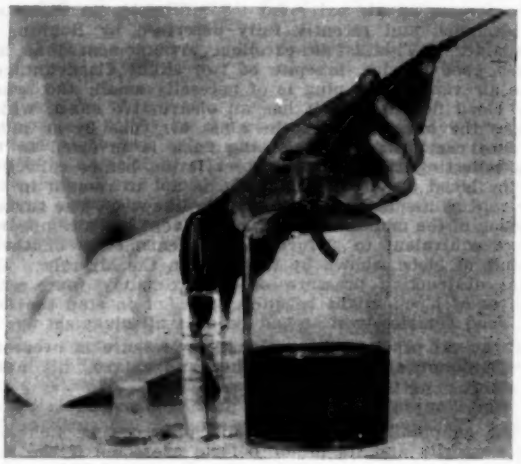

FIGURE III.
Standard litre bottle and ampoule of citrate solution, suitable for use in institutions.

Blood Transfusion with a Two-Way Tap.

The gravity technique has so far superseded the older methods that most of them have rapidly disappeared into oblivion. However, the two-way tap gave such good service over a period of years, and is so simple and reliable that it is worthy of mention. The writer still occasionally uses it for children when a small amount of blood is to be given, or for adults when a limited amount of blood is required and when a transfusion rate of 20 cubic centimetres per minute is permissible. The arrangement is illustrated in Figure V; it consists of a two-way tap made by E. T. Both, of Adelaide, which is attached

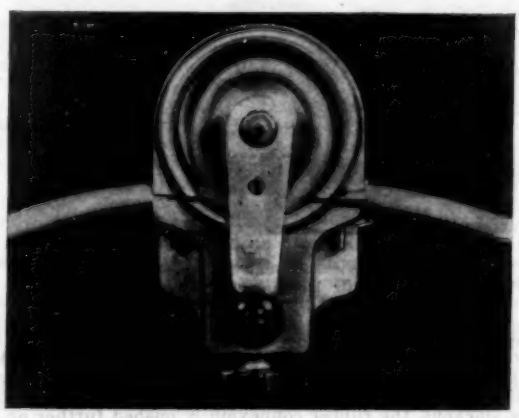

FIGURE IV.
The Riddell type rotary pump, showing adjustable section of wall of well, which permits use as a drip regulator.

to an ordinary 20 cubic centimetre "Record" syringe, the tap being held in position by the left index finger. A bayonet junction is intentionally avoided, so that a standard "Record" syringe can be used. The efferent arm of the tap leads to a spherical glass air trap to catch the one small bubble that would otherwise pass on unnoticed, and thence to a metal "Record" adapter attached

to a serum needle of small bore for adults or to a small metal cannula for infants' veins. The afferent limb leads to a metal sinker with a metal gauze filter immersed in the requisite amount of citrated blood.

Blood Transfusion during Transport.

The need for commencing or continuing blood transfusion during transport will arise from time to time in civil practice, and the possible need in military surgery has been referred to by Maycock in an account of the experiences of transfusion officers at Dunkirk.[10] He writes:

I am convinced as a result of this experience that a transfusion could be given in absolutely any circumstances except in a vehicle, and there is doubt about the last conclusion.

Recently a patient who had had a succession of severe hæmatemeses was transported nearly six hundred miles by aeroplane and twelve miles by ambulance during the administration of a massive transfusion. Proprietary flasks were used in this case and proved ideal. The flasks were suspended from the luggage rack in the aeroplane by two wire hooks, and in the ambulance the "Bickford" stand was used. The only technical difficulty encountered was that the fine vibration of the aeroplane obliterated the regular drip and converted it into a fine spray. This was overcome completely by partially supporting the flasks with rubber tubing. The rotary pump was clamped to the end of the stretcher in case the head of pressure permitted by the height of the cabin roof proved inadequate. Sterile instruments were carried so that the cannula could be changed to another vein if necessary.

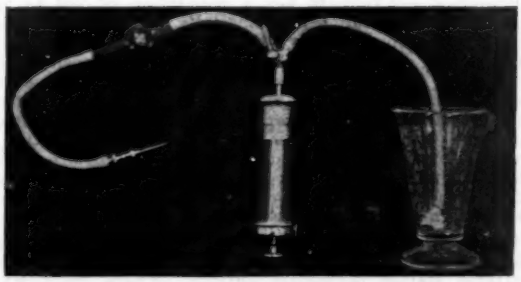

FIGURE V.
Simple two-way tap and "Record" syringe, used prior to introduction of continuous drip methods.

Cleansing of Apparatus.

Adequate cleansing is so fundamental in the avoidance of reactions and has such a direct bearing on the selection of apparatus and methods that precise reference must be made to it.

Suitable directions for the cleansing of rubber tubing are as follows:[10] (i) After each transfusion dismantle the apparatus and syringe through the tubing with cold tap water. (ii) Wash in a dilute solution of soft soap. (iii) Rinse thoroughly in tap water. (iv) Place all parts in a pan containing sodium hydroxide solution (0·1%) and boil for five minutes. (v) Rinse thoroughly in distilled water. (vi) Hang up to dry. (vii) Assemble and autoclave.

Stretching is a useful way of loosening adherent clot, and tape may be drawn through the tubing with a rifle-cleaning rod.

At the Royal Adelaide Hospital glassware is chemically cleansed by a solution prepared as follows: Commercial sulphuric acid is heated to 73° C. and potassium dichromate is added to make a 1% solution. The apparatus is then rinsed several times in water, then in distilled water, dried thoroughly and autoclaved.

Summary.

1. For blood transfusion in private practice a two-hole proprietary flask is recommended.
2. By modification of the Bonnin filling plug gravity or negative pressure can be used at will.
3. This combination is simple and lacks the defects of other current methods.
4. A Riddell rotary pump is used as a drip regulator and when necessary as a temporary augmenter of flow.
5. For institutions a standard 1,000 cubic centimetre bottle is satisfactory, and is suspended by a simple attachment.
6. A simple two-way tap for blood transfusion is described.
7. Reference is made to blood transfusion during transport.
8. The importance of efficient cleansing of apparatus is stressed and an efficient technique is described.

References.

(1) Allen and Hanbury's Catalogue, 1930, page 237.
(2) R. R. Macintosh: "A Simple Method of Blood Transfusion", *The Lancet*, Volume II, July 2, 1927, page 22.
(3) L. Colebrook and E. J. Storer: "On Immuno-Transfusion", *The Lancet*, Volume II, December 29, 1923, page 1394.
(4) G. Keynes: "Blood Transfusion", 1922.
(5) D. Browne: "A Method of Blood Transfusion with Special Reference to Children", *The British Medical Journal*, Volume I, February 14, 1931, page 259.
(6) N. J. Bonnin: "The Ætiology and Prevention of Blood Transfusion Reactions: A Safe and Simple Blood Transfusion Apparatus for General Use", THE MEDICAL JOURNAL OF AUSTRALIA, Volume I, June 17, 1939, page 888.
(7) J. M. Vaughan: "The Medical Research Council Blood Transfusion Outfit", *The British Medical Journal*, Volume II, December 2, 1939, page 1084.
(8) V. H. Riddell: "Blood Transfusion with a Rotary Pump", *The British Medical Journal*, Volume I, June 3, 1939, page 1125.
(9) J. C. Lees and G. A. Levy: "Emergency Preparation of Pyrogen-Free Water", *The British Medical Journal*, Volume I, March 16, 1940, page 430.
(10) R. M. Bartlett, L. C. Bingham and S. Pedersen: "Salt Balances in Surgical Patients", *Surgery*, Volume IV, 1938, page 441.
(11) F. A. Jones and C. N. Morgan: "Administration of Fluids to Surgical Patients", *The Lancet*, Volume II, September 9, 1939, page 611.
(12) J. Dubash, O. Clegg and Janet Vaughan: "Changes Occurring in Stored Blood in Different Preservatives", *The British Medical Journal*, Volume II, October 12, 1940, page 482.
(13) V. H. Riddell: "Blood Transfusion", 1939, page 242.
(14) W. d'A. Maycock: "Blood Transfusion in the B.E.F.", *The British Medical Journal*, Volume II, October 5, 1940, page 467.

APPRECIATION ON MEDICAL MAN POWER OF WESTERN AUSTRALIA, WITH SPECIAL REFERENCE TO ECONOMY OF PERSONNEL.[1]

By SQUADRON-LEADER N. M. CUTHBERT, M.C.,
Deputy Chairman of the Coordination Committee of Western Australia.

IT is my privilege and, I feel, my duty to bring before you this evening my "Appreciation on the Medical Man Power of Western Australia, with Special Reference to Economy of Personnel".

I prepared this in collaboration with the members of the Personnel Subcommittee — Major W. H. Godby (Deputy Assistant Director of Medical Services), Major J. P. Ainslie (President of the Western Australian Branch of the British Medical Association), Dr. Atkinson (Commissioner of Public Health), and Mr. Neilson Hancock (Honorary Secretary). The last-mentioned member has worked hard in preparing tables and statistical figures. The State Coordination Committee (Colonel D. M. McWhae, C.M.G., Chairman) has approved of its submission to the Central Coordination Committee.

INFORMATION.

General Information.—By the end of 1941 it is predicted that 2,303 medical officers will be recruited from the Commonwealth for the Commonwealth Military Forces, Australian Imperial Force, Royal Australian Navy and

[1] Read before a meeting of the Western Australian Branch of the British Medical Association on June 18, 1941.

Royal Australian Air Force. It is estimated that this will leave 2,273 for civil duties, that is, 1 to 3,000 of the population.

From all States 286 medical officers are required forthwith for the Royal Australian Navy, the Australian Imperial Force and the Royal Australian Air Force.

Local Information.—The allotted quota for Western Australia out of the number required for the Australian Imperial Force is: eight recent graduates (Category "A"), four general duty medical officers (Category "B"), eight specialists (not specified).

APPRECIATION OF THE RESULTING POSITION IN WESTERN AUSTRALIA.

Metropolitan Area.

There are 81 general practitioners in the metropolitan area (Perth, Fremantle, Midland Junction), inclusive of women practitioners (10) and practitioners over sixty years of age (9). They serve a population of 247,000, the ratio being 1 to 3,000.

If the resident medical staffs of the metropolitan hospitals are included, then the total is 106, that is, a ratio of 1 to 2,300.

Many of these medical officers attend military camps periodically, do recruit examinations and give honorary consultant service to the public hospitals.

Can further men be spared from the metropolitan area? Our opinion is: as regards Category "A", recent graduates, yes; as regards Category "B", general duty medical officers, very doubtful.

Country Districts.

Country other than the North-West.

There are 98 general practitioners at present in the area including country other than the north-west, serving a population of 234,700, the ratio being 1 to 2,400.

At the beginning of the war the practitioners in towns other than those in the north-west were distributed as follows: 52 in one-man towns, 16 in two-man towns, 12 in three-man towns, four in a four-man town, five in a five-man town, six in a six-man town, eight in an eight-man town, a total of 103.

Those who had gone on active service numbered nine, making a total of 94, to which had to be added four who replaced other practitioners, making a grand total of 98.

It will be seen that a very large percentage are located in one-man towns, which makes their relief difficult.

Northam.—Northam has a large surrounding area which cannot be assessed. The military camp established at Northam causes an increase in the civil population.

Albany.—Albany has a population of 5,500. There are normally three practitioners; the number is now reduced to two, the ratio being 1 to 2,750. (One practitioner has gone on active service overseas.)

Geraldton.—Geraldton has a population of 6,400. It is a big Royal Australian Air Force centre. There are three practitioners, the ratio being 1 to 2,130. Two of these are under the age of thirty-five years. It is possible that one could be spared; but it must be realized that there is a large outback area.

Collie.—Collie is a coal-mining town and has a population of 6,000. There are five practitioners, the ratio being 1 to 1,200. Three of these practitioners are not able to give full-time service.

Bunbury.—Bunbury, which is the site of a military camp, has a population of 7,900. There were six practitioners; the number is now reduced to four. One has joined up for full-time home service. One is retired, being over seventy years of age. Of the remaining four, one is always in camp. The ratio is 1 to 2,600.

Boulder, Kalgoorlie, Coolgardie.—Boulder, Kalgoorlie and Coolgardie have a population of 36,000. There were 13 practitioners; the number is now reduced to 12. Two men are on full time active service (one overseas). One has been replaced. The ratio is 1 to 3,000. One might be spared from general practice and the resident medical officer from the government hospital.

Outer Goldfields.—In the outer goldfields there are ten doctors (eight one-man towns) at great distances apart, spread over an area of approximately 400 square miles, and attending a population of 24,500. The ratio is 1 to 2,400.

The Problem of the North-West and the Aerial Medical Service.

In the North-West Medical Service of Western Australia there are seven full-time medical positions, namely, at Onslow, Roebourne, Port Hedland, Marble Bar, Broome, Derby and Wyndham. All these towns are on the route of the Perth-Darwin mail-plane service, except Marble Bar. At Port Hedland and Wyndham there is, however, a special "Flying Doctor" service serving remote isolated areas. For a considerable period there has been no doctor at Marble Bar (a mining town), and this has had to be served, by aeroplane, by the Port Hedland doctor. These seven doctors, when available, serve a population of 6,293 over a very wide area.

Roebourne, Port Hedland and Marble Bar.—Covering Roebourne, Port Hedland and Marble Bar there are at present two medical officers, one at Roebourne and one at Port Hedland, which is the Flying Doctor base. The latter is probably the busiest town on the coast, and the work of the Port Hedland officer has for a considerable time been increased by the necessity for him to visit Marble Bar regularly by aeroplane, in the absence of a doctor there. Marble Bar is 120 miles inland from Port Hedland and is a thriving mining town. Within a few weeks the service will lose both these medical officers, and at present there is no prospect of replacing them. The position will then be acute.

Wyndham.—Wyndham has a population of 700 to 900. It is a vital one-man town, especially in the cattle-killing season, when some 200 to 300 men go to the meat works for a period of from four to five months. Recently this town was without a medical officer, and on several occasions assistance had to be obtained by plane from Darwin. Recently, however, a temporary medical officer has been obtained, whose services are unlikely to be available after September at the latest. There are both a white hospital and a native hospital here. The medical officer also serves Hall's Creek weekly by aeroplane, and also certain inland areas in emergency.

Derby.—Derby has a medical officer, not of military age, who serves a resident population in the town and a scattered station population outside. There are a white hospital, a native hospital and, some ten miles distant, a leprosarium housing some 200 leprosy patients, who are also under his care.

Broome.—Broome has a full-time State officer (general practitioner), who serves the town and surrounding stations. There are a white and a native hospital. There is also a Commonwealth pathological laboratory in charge of a Commonwealth medical officer, who also is quarantine officer. Both men are of military age, and it is possible that one could undertake both functions. Inquiries are being made along these lines, though it is realized that the Commonwealth Department of Health is vitally concerned in such a suggestion.

Onslow.—Onslow is a small town some 120 miles south of Roebourne, which at present has a medical officer who is likely to remain.

Commentary on the North-West Problem.—It must be remembered that the north-west coastline runs from Wyndham to half-way between Onslow and Carnarvon, a distance of 1,672 miles (three times the distance between Melbourne and Sydney). The only railway north of Geraldton is the small line running from Port Hedland inland to Marble Bar. It will be seen, therefore, that, far from there being much possibility of withdrawing any medical officers from this north-west area, there will be an acute shortage in the near future, which will need every effort of ours to make it good.

Solutions to the North-West Problem.—The supply of medical officers in war-time to vital centres, such as the north-west, should be both a State and a Commonwealth Government responsibility. Hence in emergency their

medical officers should be utilized to assist. There are at present 500 Commonwealth and State medical officers in the Commonwealth.

I think that both the Commonwealth and State medical services should form a small "pool" or reserve of medical officers from which to draw at short notice men to fill vital positions which have been temporarily vacated and which cannot be filled from the usual sources. This "pool" or reserve could be filled either by volunteers from the present personnel or by new appointments.

Refugee doctors, not already employed, could be appointed to augment this reserve after an investigation had been made into their efficiency and the type of practice of which they were capable.

Also from this "pool" medical officers could be appointed temporarily to metropolitan hospitals to tide them over serious shortages.

The only alternative solutions to this problem are: (*a*) The use of military medical officers from the reserve. This is impracticable at present. (*b*) Compulsory service in the medical profession. This is undesirable for the medical profession alone. Compulsory service for the whole community anywhere is most desirable. The medical profession is doing a magnificent job of work, and I do not think that there will be any trouble in maintaining an adequate and efficient medical service to our gallant forces overseas.

All problems with regard to the medical services to the civil population and the home military forces are capable of solution by reorganizing the material at our disposal, with special regard to the economy of its use; this should apply also to Commonwealth and State medical officers.

In regard to the above it should be mentioned: (*a*) That when a Government medical officer relieves anyone in these positions the relief is only temporary and that the vacancy will continue to be advertised with a view to the obtaining of a medical practitioner under contract, preferably one who is not acceptable for service overseas. (*b*) That, in the recruiting of refugee doctors into civil practice, it is extremely important to make sure that they are in no way establishing themselves in private practice during war-time or for twelve months thereafter at the expense of medical practitioners on war service.

Regional Zones for Alien (Refugee) Practitioners.

The Government has declared two "regional zones" (Kununoppin and Kondinin) and proposes to appoint alien practitioners, who will be permitted to practise only in these defined areas under a regional registration.

These zones were created in two areas for which a medical practitioner could not be obtained, but which were in need of a medical service. One can be regarded as a war vacancy, the other as being economically unable to maintain a doctor.

Specialists.

The public hospitals are already feeling the loss of those specialists who are on full-time military service.

Specialists in each department are being appointed to advise the Personnel Committee on all matters affecting their specialty, with special reference to an adequate service to the metropolitan hospitals and the civil population.

The number of specialists available to the civil population in the future will be reduced.

It is possible for a reduced number in each specialty to meet the needs of the community provided the total work is decreased. This would be possible if the remaining specialists undertook more and more purely consultative work and excluded such work as could be performed by the patient's own practitioner, for example: (*a*) After the first consultation the remainder of the treatment could be undertaken by the patient's own doctor. (*b*) Patients at great distances from the consultant's rooms could be visited and reported on by the local practitioner. (*c*) In regard to their honorary consultant work in metropolitan hospitals, this is dealt with later.

For example, in radiology, if the work became too heavy, technicians could perform the technical work and films could be sent direct to practitioners except in those cases in which a radiologist's opinion was necessary, that is, a radiologist would be used in a purely consultative capacity. Ear, nose and throat films could be examined by ear, nose and throat consultants as far as routine films were concerned. Also routine fracture films could be examined by surgeons and practitioners except in special cases requiring a radiologist's report. Again in surgery the remaining surgeons, if overworked, could adopt similar suggestions to the above. A list of capable general practitioner surgeons has been compiled.

Comments.

From the foregoing it will be seen that Category "B" medical men must not be depleted too far in civil practice. Certainly they should not be sent abroad when Category "A" men are required.

Position in Regard to Civil Practice at Present and on Mobilization.

The position in regard to civil practice at present and on mobilization is set out in Table I. When we consider these general practitioner figures it would be well to consider the reserves of medical practitioners available. These may be classified as follows:

Medical Schools.—The other States have first preference on their own schools.

Recent Graduates Completing Hospital Duty in Western Australia.—Most graduates completing hospital service in Western Australia apply for service with the forces or return to their home States.

Female Practitioners.—All available women practitioners, with a few exceptions, are assisting in hospital work. Some are looking after their families as well.

Medical Officers Returning from Overseas.—No medical officers returned from active service are as yet available.

Comment.

Few (if any) reserves are in sight.

The Staffing of the Perth Military Hospital.

By the appointment of a full-time physician and a full-time surgeon to the Perth military hospital (in addition to the commanding officer and registrar—both medical officers—and three resident medical officers) further strain on the consultant staffs of the public hospitals has been avoided. The consulting specialists to the military hospital are employed as far as possible as consultants, the routine special work being carried out by the full-time physician and the full-time surgeon.

Metropolitan Hospitals.

It would appear that the honorary medical staffs of metropolitan hospitals might have to undertake more and more the purely consultant type of work and leave a large proportion of the routine work to the senior resident staff.

As this war progresses, these institutions must become more self-contained and self-reliant.

It is therefore essential to maintain an adequate senior nucleus in each State hospital. (The Perth military hospital has realized this by appointing a full-time physician and a full-time surgeon.)

Any member of this senior nucleus is available for service overseas, provided he can be adequately and satisfactorily relieved. It is therefore to the advantage of the metropolitan hospitals to aim at a senior nucleus composed of medical men (or women) not acceptable for service overseas. Also in future there may be medical men returned from abroad who could fill these posts, but who would not be able to stand up to the strain of general practice.

Any member of the senior resident medical staff who is incapable of undertaking the responsibility of his share of routine work (either surgical or medical) should be replaced at the first opportunity by someone more suitable.

Either the superintendent or the assistant superintendent should be capable of undertaking the routine surgery of the hospital should the necessity arise.

TABLE I.

Practitioner Groups.	Number of Practitioners.	Number Gone Abroad.	Number on Full Time.	Number Interned.	Number Left in State.	Number of Women Included.	Population.	Ratio of Practitioners to Population.
General practitioners: Metropolitan area	104	16	4	1	83	8	247,000	1:3,000
Resident medical officers at metropolitan hospitals	36	6	5	—	25	3	—	1:2,300[1]
General practitioners: Country—								
North-west[2]	7	—	—	—	7	—	6,300	1: 900
Kalgoorlie, Boulder Coolgardie	13	1	—	—	12	1	36,000	1:3,000
Outer Goldfields	11	1	—	—	10	—	24,500	1:2,400
Remaining country practices	81	4	4	—	73	2	174,200	1:2,300
Full-time Commonwealth and State service	21	1	1	—	19	3	—	—
Specialists	57	9	3	—	45	0	—	—
Total	—	—	—	—	274[3]	17	488,000[4]	1:1,800
Not in practice when enlisted	8	4	4	—	0	0	—	—
Locums available— Men 7, Women 7	14	—	—	—	14	7	—	—
Retired from practice—not available for service— Men 15, Women 2	17	—	—	—	17	2	—	—
Grand total	369	42	21	1	305	26	—	—

[1] If resident medical officers of public hospitals are included.
[2] A tract of country 1,672 miles in extent.
[3] The number 274 includes 257 men in active practice and 17 women.
[4] The total 488,062 is taken from the latest official return for the population of the State; it consists of 204,196 in the municipalities and 283,866 in roads boards areas.

The following is suggested as a senior nucleus for the various metropolitan hospitals: Perth Hospital: superintendent, assistant superintendent, two senior registrars; Children's Hospital: superintendent, assistant superintendent; Fremantle Hospital: superintendent, assistant superintendent.

For the junior resident medical officers it is recommended that:

1. Preference should be given to those who have enlisted or propose to enlist for service abroad. It would be an admirable stimulus to recruiting of this type of medical practitioner if he could be given the rank and pay of captain immediately on volunteering for service overseas. He could then be seconded for further hospital training prior to going abroad. This has already been recommended to the Deputy Chairman of the Central Medical Coordination Committee.

2. If possible, more resident medical officers than are on the hospital establishment should be obtained so that there would be a pool from which to draw medical officers for service overseas or to fill vacancies on the senior staff.

3. Should one or other of the hospitals be short of resident medical officers an appeal should be made to the superintendent of the hospital with an excess or a full staff for one or more of his resident medical officers to take a term of duty in the hospital with the deficiency. At the present time no medical practitioner will be accepted for service unless he has completed a term of hospital work. The senior resident and honorary medical staffs are responsible for the efficient training of these resident medical officers in hospital during this period.

4. In order to economize in medical man power, stenographers could be employed to assist resident medical officers in the clerical work associated with their rounds in hospital. Resident medical officers would then be capable of undertaking a far greater amount of clinical work, or, on the other hand, be released earlier for work elsewhere in the hospital.

5. A committee consisting of the medical superintendent of each of the three metropolitan hospitals and a medical practitioner representative from the board as members and a chairman from the medical department should be formed to deal with matters relating to the supply of resident medical officers to these hospitals.

The "A.R.P." Allotment of Medical Practitioners.

The "A.R.P." allotment of medical practitioners at May 21, 1941, was as follows:

First aid posts		8
Fremantle Hospital		8
Perth Hospital		8
Number 1 Civilian Base Hospital		12
Number 2 Civilian Base Hospital		12
Total		48
Specialists	3	
General practitioners	45	

Should the necessity arise to post any of the medical officers under this scheme, they will of course still be available for duty with the civil population in their new locations.

Civil Practice: The Increasing Strain on the Medical Profession.

With further reduction in the number of medical practitioners in civil practice the relief of strain on the civil medical practitioners must be considered.

The resident staffs of the public hospitals may have to undertake more in-patient and out-patient work and use the honorary staffs for purely consultative work. This is not possible unless the senior hospital staffs are complete and thoroughly qualified.

The medical practitioners themselves should organize their private practice with a view to reducing and concentrating their work. Civil practice can be modified considerably without loss of efficiency, more medical men thus being released and the present strain on the practitioners themselves being relieved.

The following suggestions are made:

1. No patient need be visited if he or she can come to the consulting rooms at the stated hours. (Twenty or thirty patients could be examined at a clinic in one and a half or two hours if the necessity arose. A similar number visited at their homes would take some five or six hours at a very minimum.)

2. Calls from localities outside a reasonable distance from the practitioner's surgery should be dealt with by a practitioner nearer at hand.

3. By operating always at one hospital and grouping operation cases together practitioners can save time and effort.

4. Nearby towns with no medical attendant could arrange transport of patients to the doctor's surgery in the adjacent town, in this way avoiding for him an unnecessarily long absence from his rooms. The Transport Board could cooperate in permitting patients to travel on unlicensed vehicles.

5. Should specialists' groups be greatly reduced, then their public hospital work could be concentrated at one hospital and patients from other centres or hospitals transported to them irrespective of boundaries, localities or ages. One could go further and imagine private patients being seen at the same clinic if mobilization created such a situation.

6. Even now a notice might be placed on the desk of each consultant, superintendent, or resident medical officer seeing patients in metropolitan hospitals, as follows:

> In order to assist in the general effort to reduce unnecessary work in war-time every endeavour should be made (with due regard to efficiency of treatment) to complete the investigation in each case rather than to refer the patient elsewhere.

For example, a patient may complain of more than the one condition for which he or she has come for advice. If it is possible for the doctor to advise and treat this condition and save reference to another department, this would save double handling by the medical and administrative staffs. A good general practitioner, male or female, in an out-patient department could complete the investigation in the majority of cases that come before him, whereas a junior resident medical officer would probably refer a large proportion of the patients elsewhere.

7. On mobilization the community will have its mind more closely focused on war and its immediate dangers, so that the minor ailments and the less urgent disabilities will not be considered of sufficient importance to warrant medical advice. Hence we must not be unduly worried about a reduced medical service to the community at this time. Also military medical officers will be available to see and treat or transport civil patients in emergency.

The present home forces (Navy, Army and Air Force) medical officer requirements might be revised. It is considered that the time has arrived when the position in regard to the ratio of the number of medical officers to military personnel on full-time service should be reviewed. A comparison with the ratio for the civil population would be interesting.

It is realized that medical officers have to be trained, but when their training has been completed, then a reduction in the number of medical officers called up for home service should be possible: (*a*) Because the numbers are based on the requirements of battle and casualties. (*b*) With the present mechanization of the forces it should be possible to arrange transport so that sick parades could be held, and other persons be treated, in different centres, thus reducing or eliminating the work of some of the medical officers.

It seems that some investigations could be made along these lines to prepare for the time when it might be necessary to reduce the number of medical officers serving with the home forces.

Of course, in the Army it is realized that there is very often a large amount of clerical work to be done; but a proportion of this might be relegated to non-medical personnel, for example, in the case of military hospital registrars.

Comment.

Some of these remedies are undesirable, but nevertheless must be kept in mind.

The importance of a known quota system which will admit of these arrangements being brought in gradually when required and with as little disorganization as possible is obvious.

Special Enlistment of Women (Voluntary Aid Detachment Organization) in Relief of Medical Man Power.

By enlisting the aid of women (organized under the Voluntary Aid Detachment) medical man power could be conserved both in the home forces and the civil medical services. There also seems to be no reason why the same economy could not be extended to some of the base medical services abroad.

The medical service section of the Voluntary Aid Detachment should be trained in: (*a*) The giving of inoculations under medical supervision. (*b*) The taking down of histories. (The voluntary aids should be supplied with medical dictionaries or build up a medical vocabulary as they go along.) (*c*) The filling in and checking of all necessary forms. (*d*) Relieving the medical officers and medical practitioners of the mass of clerical work necessary in metropolitan hospitals, and particularly military institutions *et cetera*.

As the members of the detachment attain efficiency with the home forces, enlistments for overseas could then be instituted.

Tabulation of Quota and Comments Thereon.

Table II is a tabulation of the quota of medical practitioners.

It is suggested that the allotments for each category should be based on the following considerations: (*a*) population of each State, (*b*) number of medical practitioners registered in each State, (*c*) number of each category medically fit for service in each State, and (*d*) a special allowance or "coefficient" for Western Australia.

To compare these, each State must be considered by the type of civil service necessary to meet the local needs. In Western Australia we have a situation which differs from all other States in that: (*a*) There are huge areas with a widely scattered population. (*b*) There are many "one-man" towns, a number of which are "vital". (*c*) The distances between these "one-man" towns are relatively large. (*d*) The type of road is poorer and railways are much slower than in other States. (*e*) Petrol considerations make it difficult for the population to travel long distances to the doctor. (*f*) We have no medical school to supply locally the type of medical practitioner required for overseas service.

The Personnel Committee wishes to be assured on this method of allotment. It feels that it will fail in its duty to the three services and the civil population if the civil population is put to a disproportionate neglect and

TABLE II.

Group.	Required Now.	Now on Service Abroad.	Now on Full-time Home Service.	Remaining in Practice.	When Quota Filled Total on Full-time Service.	Percentage of Total.
Recent graduates, category "A"	8	9	8	45	25	30
General duty, category "B" ..	4	25	12	182	41	18
Specialists	8	9	2	43	19	31
Total	20	43	22	270	85	24

inconvenience. The committee cannot recommend depletion of the services to the civil population without adequate reason, especially when it is only a matter of the assessment of a proportionate quota to this State, which should present no real difficulty. The committee is quite prepared to accept a variation of the quota system if such a variation becomes necessary (as sometimes happens in war), but the basis of demand must be on the quota system, with due regard to the special difficulties of the Western Australian civil medical service.

The demand on the Commonwealth for medical officers for the services abroad must be met in full; but it is realized that modification is possible as far as the medical service for home defence and the civil population is concerned. On mobilization, of course, the military requirements immediately become paramount. The difficulties to be faced in the organization of medical services for the civil population are bound to increase and every endeavour should be made to minimize them. This can be achieved by making only necessary demands under a known quota system on the above basis. It must be realized that as far as Western Australia is concerned, any further reduction in its medical practitioners will entail strain on the civil population and the public hospitals, not to mention the medical practitioners themselves.

The importance of obtaining an adequate number of Category "A" medical officers for service overseas is realized. If men of this category are not forthcoming, then Category "B" medical officers will have to fill their places. Category "B" medical officers taken from civilian practice cause greater disorganization that Category "A". Accordingly, at the request of the Director-General of Medical Services, a circular was dispatched on May 6, 1941, as follows:

The Director-General of Medical Services for the Commonwealth has asked me, as Deputy Chairman of the State Co-ordination Committee, to bring to your notice the urgent need for medical officers for the 2nd A.I.F.

You will have already realised that the 2nd A.I.F. has been seriously engaged in action, and it is anticipated that it will become more and more involved in the defence of Australia abroad.

The Director-General of Medical Services knows that the profession is anxious to give these men the best skilled medical service.

It is the duty of the State Co-ordination Committee to see that the supply of medical officers to the three services (Navy, Army and Air Force) at home and abroad, and to the civil population, is adequate for their various needs. The civil population must, therefore, be depleted of its medical practitioners, due regard being paid to its vital needs.

I would therefore ask you to let me know as soon as possible if you intend to enlist for service with the A.I.F.—

(*a*) forthwith

(*b*) in the near future:

if so (approximately) when would you be available?

If you do not intend to enlist for service with the A.I.F. it would greatly assist if you would kindly indicate for the information of the Committee your reasons, in order that the Director-General may form some idea of the number of officers available for the A.I.F. in the future.

It is the present policy of the Military Forces not to accept a medical practitioner for service overseas until he has been graduated for 12 months.

You will realise of course that it is the function of the Co-ordination Committee to decide whether or not you can be spared from civilian practice.

On behalf of the Personnel Committee (Major W. H. Godby, D.A.D.M.S. acting for D.D.M.S., Dr. J. P. Ainslie, President B.M.A., Dr. Atkinson, Commissioner of Public Health).

(Sgd.) N. M. CUTHBERT,
Deputy Chairman.

GENERAL SUMMARY.

1. The policy of the Personnel Committee is to supply medical officers, first, to the forces overseas, secondly to the home forces, and thirdly to the civil population, at the same time coordinating all three. Also it must ensure that all medical men are being used economically to their fullest capacity.

2. The supply of medical officers to the forces overseas is unalterable, being entirely dependent on reinforcements required and recruit enlistments.

3. The civil population will have its medical services reduced as further demands are made for medical officers by the overseas forces and home defence.

4. Few reserves are in sight even to replace normal wastage in civil practice, such as is occasioned by death, incapacity, the relinquishing of practice *et cetera*.

5. In the event of the medical service to the civil population being depleted too far, then the demands of the home forces (Navy, Army and Air Force) may have to be modified or revised. They may even have to be coordinated to assist in serving the civil population.

6. Special enlistment and training of women within the Voluntary Aid Detachment organization to relieve medical officers and practitioners of clerical and administrative work may be advisable.

7. Given a known quota system, with due regard to Western Australia's special disabilities, a readjustment of the civil and home defence medical services could be achieved. To be asked for our maximum effort now, in the absence of a known quota system, tends to disorganization rather than coordination.

"Give us our quota and we will finish the job."

ADDENDUM.

Since I wrote this appreciation Sir Alan Newton has informed me that on review of the percentages for men on full-time service from each State it appeared that an allowance had been made for both Queensland and Western Australia, in view of their more scattered population and consequent difficulties in releasing practitioners.

Reviews.

SURGICAL PATHOLOGY.

SINCE the first edition of "A Text-Book of Surgical Pathology", by Illingworth and Dick,[1] appeared in 1932, a new edition has been published every three years, and the war has failed to prevent the production of a fourth. This book, which was to some extent the outcome of extramural teaching in Edinburgh, has long since been accepted as one of the standard works on surgical pathology, and has no doubt earned and retained its popularity because of accurate conciseness, albeit unrelieved by interesting digressions.

In this edition a certain amount of revision has been carried out, and among the new subjects added are tetanus, cystic disease of the lung, gall-stone ileus, and stricture of the rectum.

Reference is made to the serological grouping of the hæmolytic streptococci and to the importance of air carriage in relation to wound infection. Due emphasis is given to the importance of local fluid loss in shock.

A few errors remain in an otherwise excellent summary of hydatid disease. The terms ectocyst and adventitia are not synonymous, nor are the terms secondary cysts and daughter cysts. We would not agree that peripheral cysts of the lung do not usually cause adhesions.

In the discussion on occupational cancers reference is made to the work of Alexander Scott, of Broxburn, on shale-oil cancer; but the circumstances of this prolonged and painstaking clinical research in general practice deserve mention.

Recent work indicating the ischæmic nature of Volkmann's paralysis receives notice, and rupture of muscles, including the *rectus abdominis*, is adequately dealt with.

It is pleasing to encounter again the terms "traumatic osteoma" and "mesenteric vascular occlusion", which have long been used in the Edinburgh school.

Syphilitic bursitis is omitted, and more emphasis could have been placed upon the cardiac effects of arterio-venous aneurysm and secondary toxic goitre.

In the section on urinary calculi due mention is now made of "recumbency stones". The description of the ovarian hormones has been brought up to date, and vitamin *K* now appears in the account of obstructive jaundice.

Altogether the book remains a fund of compressed and reliable information and is a credit to the authors and their respective schools.

For inclusion in future editions, however, we would suggest a discussion on the pathology of blood transfusion reactions, fluid and chloride balance, and an amplified account of cholæmia.

[1] "A Text-Book of Surgical Pathology", by C. F. W. Illingworth, M.D., Ch.M., F.R.C.S., and B. M. Dick, M.B., F.R.C.S.; Fourth Edition; 1941. London: J. and A. Churchill Limited. Medium 8vo, pp. 736, with 300 illustrations. Price: 38s. net.

The Medical Journal of Australia

SATURDAY, SEPTEMBER 13, 1941.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

THE STUDENT AND THE CURRICULUM.

THOUGH it is possible that the much-to-be-desired ideal medical curriculum may some day be drawn up, it is quite certain that such a document would not be effective for very long. Knowledge of the medical sciences increases at such a pace, the unexplored field of research becomes wider and wider, and conditions of medical practice change so rapidly that this is easily understood. In the last decade or two the medical curriculum has been redrafted in more than one Australian university, and owing to the war and the urgent need for medical graduates to serve in the three arms of the defence forces, modifications have recently been introduced, modifications that are supposed to be temporary, "for war purposes only". In December, 1932, C. G. Lambie, Professor of Medicine, and H. R. Dew, Professor of Surgery in the University of Sydney, in an article in this journal on the medical curriculum of the University of Sydney began by pointing out that the object of a medical curriculum was the training of medical men, most of whom would be engaged in the practice of medicine and surgery. This is the basic consideration that must be kept well in view whenever discussions on changes in the curriculum arise, as they inevitably will arise from time to time. The two Sydney professors went on to remark that since medicine was not merely a craft having its roots in scientific and humanistic soil, the medical curriculum should be framed with a view to securing not only an adequate professional training, but an academic and cultural background capable of providing the means of growth and development. The new curriculum described by Professor Lambie and Professor Dew in 1932 and adopted by the Sydney school was drafted as far as equipment, facilities and general resources would allow, to meet the requirements stated by these definitions; but alterations have since been made. The curriculum in the Melbourne and Adelaide schools, like that of Sydney, has been evolved from many years of gradual development; the evolution has been characterized by a series of changes that have been made from time to time without fuss or bother, and each of the three schools has acquired a well-deserved reputation. The University of Queensland in the recent establishment of its Faculty of Medicine had a wonderful opportunity to plan the education of its medical graduates without having to cast off the dead-weight of outgrown usages, and the curriculum was planned to meet what were thought to be the special needs of the northern and semi-tropical State. In all the Australian States the academic garment has been cut according to the available cloth, and this probably accounts to some extent for the differing types of organization in certain departments. By and large, however, it is safe to say that the teaching on both the theoretical and clinical sides is carried out along generally similar lines in all four Australian medical schools.

When a young man leaves school to become a student of medicine in a university, he passes insensibly from a stage in which his actions have been controlled from day to day, in which he has been set certain tasks and has had to produce evidence that he has carried them out; his failure in set tasks is attended by punishment of one kind or another. At a university he attends lectures and demonstrations, he may be diligent in his study from day to day or he may be slack, careless or entirely negligent as it pleases him, and the only obvious punishment visited on him will be his failure to pass set examinations. He learns to order his study, to work out a new way of life, to stand on his own feet and not to be dependent on the immediate and constant direction of a teacher. In other words, on his entrance to a medical school the student has arrived at man's estate. Most medical students are gifted with a certain amount of native intelligence, and their course of study in science and medicine teaches them to be observant and critical and also logical in their judgements. Students of the present day are in some respects more fortunate than their fathers were. Like their fathers, they see where their study is leading them and they are quick to grasp the essentials of their life's purpose, but they do this in the light of the freedom of youth and with a greater independence of thought and expression than their fathers enjoyed. They are rightly taught, and doubtless appreciate, as their fathers before them did, the tradition of medicine as an instrument in the service of humanity. Unfortunately there are, we may be sure, some among them who regard the practice of medicine as nothing more than a means of gaining a living, and of gaining it in what they suppose to be a superior and respectable way. But materialism, if it does show its mercenary head, is more often than not a manifestation of later life; and we can conclude that unless they are led aside to the worship of false gods the majority of students are qualified to make a shrewd appraisal of the teaching given them and of their teachers, and also to give a constructive opinion of the curriculum as a whole. If evidence were needed for such a conclusion it would be found in the report of the joint committee of the Legislative Council and Legislative Assembly of New South Wales, "upon hospitals, honoraries, graduands and patients", published this year. Students from the fifth and sixth years gave evidence as well as junior resident medical officers, and while it is true that many of the questions put to these witnesses were leading questions, the opinions elicited were always interesting, sometimes stimulating and occasionally provocative.

In *The Lancet* of April 12, 1941, will be found an account of a conference of students that was held at Cambridge, England, this year. Over eleven hundred attended and between two and three hundred of these were members of the British Medical Students' Association. The opening portion of the report contains some statements that should make a certain type of older graduate do some heart-searching. "Students always make an impressive audience to their elders because they show that altruism which later experiences seldom leave undulled. They have a generosity which might build a new world, if the world into which they are about to step was not geared to destroy that very quality. This may account for the impatience with which one or two of their lecturers summed up at the end of discussions; it is never very comfortable to meet one's former ideals face to face after twenty years of compromise. The students were idealistic, yes; impractical, yes—even at times woolly. But they have, it seems, a keen social conscience, an anxiety to learn preventive medicine, to change those industrial conditions now injuring the health of their fellows and to turn medicine from a routine of patching up to something more constructive." *The Lancet* makes the pungent remark that this great head of energy and weight of goodwill is ineffective only because society is arranged in such a way that it is not harnessed. At the conference it was stated that at one medical school the students' union had studied the curriculum and had made suggestions to the staff committee; the result was that some of the suggestions were accepted, and one of the consequences was the formation of seminar classes which were to be attended by not more than fifteen people. From one school came a complaint of bad teachers; in another school lectures in psychology were given by a lecturer who was not a psychologist; a student from another place attacked the system of set lectures and held that if voluntary attendance at lectures was introduced, the lecturers would improve their technique; another suggestion was that more attention should be paid to minor ailments and that less time should be given to the presentation of a complete course in advanced operative surgery; another student complained that in spite of a lengthening course in chemistry, there was no teaching about industrial poisons. Apparently all present were in favour of teaching on discussional lines.

For all the views set out in the report a great deal might be said; this does not mean that they would necessarily be accepted. It is clear, however, that the views of students are worthy of serious consideration. Ever since the publication of the New South Wales Parliamentary report it has appeared desirable that an attempt should be made to discover whether the views of students in the four Australian medical schools on the medical curriculum and on medical teaching could be obtained, whether, in the words of *The Lancet* report, the energy and goodwill of students could not be harnessed and made effective. That students in Great Britain have voiced their opinions has quickened the idea, and a plan is already being made to give Australian students an opportunity of doing what those in the Old Country have done. We believe that this step will stimulate and improve the teaching in Australian medical schools.

Current Comment.

CEREBRO-SPINAL FLUID AS SUBSTITUTE FOR BLOOD IN TRANSFUSION.

THE story of the injection of a blood substitute in cases of hæmorrhage or shock begins with physiological saline solution roughly made by dissolving a teaspoonful of common salt in a pint of water, preferably tap water sterilized by heat. Such saline solution was soon found to be incapable of wide application on account chiefly of its low viscosity, for unless there is adequate peripheral resistance at the arteriolar level a proper arterial pressure cannot be maintained. The late W. M. Bayliss sought to increase the viscosity at first by adding gelatine, but the danger of tetanus infection led him to abandon this idea and to employ gum acacia after its excess of calcium had been removed. This method had quite a vogue in the last war and undoubtedly saved many lives; but it was soon realized that the osmotic pressure of cell proteins was not counterbalanced by an iso-osmotic concentration of protein or other colloid in the transfusion saline solution and, of course, the oxygen carrying capacity remained a fraction of what blood can accomplish, and so the modern era of blood transfusion began. The latest suggestion is to use ox cerebro-spinal fluid in order to obviate the many difficulties and dangers of blood transfusion.[1] It is claimed that there is no species specificity and no danger of serum sickness or anaphylactic shock; further, the keeping power of cerebro-spinal fluid is much greater than that of donor blood. The criticism immediately suggests itself that the low protein concentration of cerebro-spinal fluid will leave unbalanced the protein of the living cells of the body with danger of dropsical turgescence. Further, the viscosity of cerebro-spinal fluid is close to that of ordinary saline solution and the disability which Bayliss pointed out and remedied remains uncorrected. Again the protein present, low as its concentration may be, is quite ample enough to produce distressing anaphylactic reactions. We fear that transfusion of whole blood, difficult though it may be, must still remain the routine procedure.

AURAL HÆMORRHAGE FROM A LEAKING CAROTID ARTERY.

IN July of this year an important case was reported in this journal by C. M. Eadie, of Melbourne; it was one in which acute suppurative *otitis media* and mastoiditis were followed by severe hæmorrhage from the ear. Ligation of the internal, external and common carotid arteries was followed by recovery. Attention must now be drawn to a report by Neville Young[2] of bleeding of the ear from what he calls "leaking aneurysm of the extracranial portion of the internal carotid artery". It is unfortunate that Young has referred to aneurysm, for he deals with an acute inflammatory event which, though rare, may arise in the experience of any practitioner. That an inflammatory process in the upper retropharyngeal areolar cleavage spaces may cause erosion of the adjacent great vessels, is well recognized. The resulting blood leakage and extravasation are not well described as aneurysm, and the use of this term may lead to confusion.

In presenting a report of two patients, one of whom died and provided opportunity for post-mortem study, Young describes a train of events, which, when compared with the course of symptoms and clinical findings in 26 cases collected from the records of other writers, forms a classical clinical syndrome. Even though rare, this clinical syndrome should be well known, for only with its recognition may lives be saved by appropriate interference. Free bleeding from the ears is often thought of

[1] A. P. Friedmann: *"Liquor als physiologischer Bluterssatz bei Blutverlusten", Bulletin de biologie et de médecine expérimentale de l'Urss.* Volume IX, Number 4, 1940, page 285.
[2] *The Journal of Laryngology and Otology*, February, 1941.

as likely to be coming from the jugular bulb or from the bony encased arch of the internal carotid artery, and it is to the middle ear that the surgeon's thoughts are likely to be directed. In Young's two cases, and in most of the other 26 referred to, bleeding was from a fistula through the antero-inferior wall of the external auditory canal superficial to the tympanic membrane; indeed the middle ear is likely to be untouched by the course of events. An infective process in the neck, especially in the para-pharyngeal lymph glands or areolar spaces, may readily erode the internal carotid artery. Leakage of blood is then liable to spread into the well-recognized cervical areolar planes so that a bulging into the pharynx and hæmorrhage from the throat may occur. This is an event which all might anticipate. In Young's two cases and in the 26 others referred to, however, the earliest and most striking symptoms were aural. Aching in and around the ear, swelling below and behind the angle of the jaw and free hæmorrhage from the ear were the early and striking symptoms. The hæmorrhage was found to come from a fistula in the floor of the external auditory meatus. In the throat a bulging of the lateral pharyngeal wall, either beneath or behind the tonsil, was noted. In many cases spontaneous hæmorrhage from the throat also occurred. Relevant findings at autopsy in one of the author's cases were as follows: (*a*) A pouting rent was present in the wall of the pharynx at the level of the tonsil and behind the posterior faucial pillar. (*b*) A fistula in the floor of the external meatus passed inwards and downwards for more than one inch. (*c*) A rounded cavity beneath the sterno-mastoid muscle contained blood clots. (*d*) The internal carotid artery lay exposed in this cavity and opened into it through a ragged slit. Also there was direct connexion with this cavity through both the pharyngeal and the aural fistulæ.

Young's conclusion is that hæmorrhage escaping into the parapharyngeal space first forms a hæmatoma there. Next escape takes place into the parotid sheath, whence, following the path of least resistance, the blood passes upwards to reach the external auditory meatus through the fissures of Santorini. Early recognition of the course of events is the keynote of treatment. Ligature of the internal carotid artery will then be the obvious essential towards saving the patient's life.

ARTIFICIAL RESPIRATION IN THORACIC SURGERY.

THE very number of devices which have been suggested for the carrying out of artificial respiration in the human subject indicates that none is really satisfactory. It would be amusing, were the issue not so grave, to note the designs evolved by inventors ignorant of anatomy and physiology who, nevertheless, have felt competent to criticize the appliances used by members of the medical profession fully aware of the complexities of the problem. For example, much ingenuity has been expended from time to time, despite full, and one would think final, condemnation by experts, in the production of an apparatus which would suck air out of the lungs as well as blow air in. Such an action is not only unnecessary, for the elasticity of the lung itself, the weight of the thorax and the tension in the abdomen can always be relied on to carry out the expiratory act, but is actually dangerous. Not long ago and with some flourish of trumpets, the enclosure of the whole body apart from the head in an "iron lung" was condemned as unnecessary if not stupid and the rigid container with rhythmic alterations of pressure was restricted to the thorax. It apparently never occurred to the complacent inventors that if the diaphragm were paralysed, the inspiratory phase of the apparatus would suck the abdominal viscera into the chest, and with peculiar results. The use of a constant pressure jet through a tracheal cannula had the advantage of preliminary animal experiment conducted by trained investigators; but the necessity of rhythmic change of volume in the lung was not at first recognized—it is significant that the apices of the lungs which participate least in normal respiration are the most open to tuberculous invasion.

In all those devices in which air is forced into the lungs the effect on the circulation of the blood is just the reverse of what happens when breathing is natural. In ordinary inspiration the circulation of blood is aided by the combined action of aspiration in the thorax with compression of the veins in the vascular abdominal area; but in artificial respiration with forced dilatation of the lungs the customary negative pressure in the thorax becomes positive and the flow of venous blood to the right side of the heart is impeded. Yet it must be conceded that in cases of open pneumothorax a positive or plenum system of lung inflation is unavoidable and one can only hope that the period of its application will be short and that unpleasant complications will not ensue.

No method of artificial respiration yet devised has even remotely approximated the natural adjustment of the breathing to the maintenance of the standard hydrogen ion concentration of the blood. With most if not all systems of artificial respiration the removal of carbon dioxide is excessive and a condition of alkalosis ensues. This is now recognized and precautions are taken to regulate the degree of lung ventilation and if necessary to add sufficient carbon dioxide to the air supplied. The latest device for ventilating the lungs in open pneumothorax is described by Frederick Mautz,[1] of Cleveland, Ohio, who has modified the existing closed system for anæsthesia machines by enclosing the breathing bag in a rigid container and by means of a simple mechanism injecting intermittently compressed air between the container and the bag. The net result is to force air into the patient's lungs with the unavoidable results, we may add, of all such plenum methods. Where Mautz has failed in his exposition is to demonstrate that the indirect method of positive ventilation of the lungs is really superior to any of the known direct methods. The claim of the inventor as against the older systems of mechanical respiration is that it is more possible to standardize the bag pressure fluctuations, and further, that prolonged application of the respiratory procedure has been made easier. Be this as it may, it is still no reflection on Mautz's ingenuity to say that the problem remains unsolved.

GASTRIC LESIONS FOLLOWING HEAD INJURIES.

IN *The Lancet* of October 27, 1934, Dodds, Noble and Smith reported that by the injection of pituitary extract prepared in a certain way they were able to produce hæmorrhage from the stomach of rabbits. The lesion from which the hæmorrhage occurred was in the acid-bearing area of the stomach. Changes were evident in so short a time as fifteen hours after the injection was given. Keith Simpson has referred to this work in the opening sentences of a report on the stomach of a man of thirty-one years of age, who sustained a fracture of the skull while at work.[2] The patient died forty-four hours after the accident. At post-mortem examination the fracture was found to have injured the stalk of the pituitary gland and the region of the tuber immediately above it. The stomach (Simpson reproduces a coloured drawing of it) was discoloured by hæmorrhage into the mucosa and by dark acid hæmatin from escaped blood adherent to the surface. These appearances were sharply confined to the oxyntic cell bearing area of the organ. Simpson states that Dodds and Noble, writing in 1937, showed that an acid reaction was important for the occurrence of this phenomenon. Simpson, on the other hand, suggests that the effect of the acid may be merely to lower the threshold of another gastrotoxic substance. In any case, he points out that this type of lesion, as may be well understood, has assumed a medico-legal significance.

[1] *The Journal of Thoracic Surgery*, June, 1941.
[2] *Guy's Hospital Reports*, Volume XC, Number 1, 1940-1941.

Abstracts from Medical Literature.

OPHTHALMOLOGY.

The Measurement of Heterophoria.

NIGEL CRIDLAND (*The British Journal of Ophthalmology*, April, 1941) has endeavoured to introduce more accuracy into our conception of heterophoria and its measurement. He uses the word "basic" as a prefix to any term in "phoria" to show that the phoria is measured in effective emmetropia and at infinity. He defines basic orthophoria as that state of the eyes in which no deviation occurs from the functional primary direction when fusion is partly or completely suspended. The anatomical position of rest is unrealizable in a normal pair of eyes "because it is impossible to eliminate the totality of nervous influences" (Bielschowsky). This position in the absence of secondary pathological changes is invariably divergence. Closely akin to this, but with the addition of the effect of minimal, balanced tonus of all the extraocular muscles, is the physiological position of rest. The latter is changed into the fusion-free position by the addition of effects of the postural and fixation reflexes. According to the test employed and to the care given to the ancillary conditions, the position of rest revealed by any test for hyperphoria may be the fusion-free position, or some position intermediate between this and the physiological position of rest, or any perversion of either. The physiological position cannot be obtained by any practicable test yet devised. It is the fusion-free position that is sought in tests for heterophoria, and therefore the fusion reflex must be excluded and the postural and fixation reflexes are to be stimulated in such ways only as will not cause a false deviation of the visual axes. This is not attained in the majority of tests. The wearing of glasses for a test is insufficient, for they must have been worn previously for long enough to have reestablished a normal accommodation-convergence ratio. The tests can be made too hurriedly; generally speaking, enough time has been given when two successive measurements are the same.

Treatment of Angiomatosis Retinæ.

H. KAYE (*Archives of Ophthalmology*, March, 1941) reports two cases of *angiomatosis retinæ* in a man, aged twenty-four years, and his sister, aged twenty-six years. The latter had lost one eye from this cause after unsuccessful treatment with radiation. They both showed a typical angiomatous tumour in the temporal periphery of the retina—a red globular mass with enlarged artery and vein. Both patients were operated upon by H. Stallard in London by a combination of katholysis and surface diathermy. The author had followed these two patients for twelve months and reports a completely satisfactory result.

Operation for Entropion.

J. S. MAXWELL (*American Journal of Ophthalmology*, March, 1941) describes an operation for entropion. An incision three millimetres from and concentric with the lid border is made from canthus to canthus, two millimetres beyond the last external and internal cilia. The incision is deep into the tarsus. A second incision is made above this, starting from the canthus and swinging upwards from three to eight millimetres at the widest part of the ellipse and back to the other canthus. The ellipse of skin is removed. The orbicularis muscle is removed. The tarsus is shaved off from above downwards. Three mattress sutures are inserted, passing through the lid margin (behind the lashes), mattressed through the upper part of the tarsus and brought out again through the lid margin. The sutures are tied and the six ends are twisted and fastened by adhesive above the eyebrow. No skin sutures are used. The operation and hæmostasis are facilitated by the use of a strong metallic elevator behind the lid pushed well upwards and forwards. The first dressing takes place on the fifth day; the sutures are removed on the seventh day.

Surgical Treatment for Spastic Entropion.

A. R. ROBBINS (*Archives of Ophthalmology*, March, 1941) describes the following operation for entropion of the lower lid. An ample external canthotomy is done with straight scissors. The outer third of the lower lid is grasped with forceps or fingers and pulled forwards and upwards to make the lateral attachments taut. Straight scissors are introduced downwards at the margin of the canthotomy wound at the lower lid, the points entering between the conjunctiva and the skin. The muscle attachments and the fasciæ are severed downwards for one to two centimetres until the lid feels lax. Two sutures close the canthotomy wound thus: the needle passes through the skin of the upper lid and emerges without including the conjunctiva. In the lower lid it passes through the conjunctiva and emerges without including the skin.

The Eye and Sleep.

J. E. LEBENSOHN (*Archives of Ophthalmology*, March, 1941) credits L. Mauthner with discovering in 1890 that sleep depends on a temporary suspension of function of the hypothalamus, which interrupts conduction to and from the cortex. Sleep begins with a spastic closure of the lids by the orbicularis muscle; the levator then becomes toneless, the pupil is constricted, and congestion of conjunctiva, exudation of mucus and conjunctival secretion take place. The ocular findings in pathological sleep have been studied in lethargic encephalitis. The numerous symptoms of which patients suffering from chronic conjunctivitis complain are well known. The author prefers to call it conjunctival asthenopia. The resemblance of the syndrome to the ocular symptoms of loss of sleep gave the author the suggestion that in many cases the underlying cause is a depression of activity of the sympathetic nervous system, for which the logical treatment would be the administration of a sympatheticomimetic drug. A satisfactory response is generally secured with the exhibition of 0·5 to 1·0 gramme of desiccated thyreoid substance daily.

Keratitis due to Mumps.

R. W. DANIELSON AND J. C. LONG (*American Journal of Ophthalmology*, June, 1941) report a case of keratitis as a rare complication of mumps. The patient was a boy, aged nine years, with bilateral parotid swelling and poor vision in the right eye. Two days after the onset the eye became red and tender, and later the lower portion of the cornea became cloudy. The cloudiness increased to its maximum on the tenth day, with some circumcorneal injection. The cornea then improved rapidly every day. Seven cases have been found in the literature.

Optic Neuritis caused by a Coal Tar Hair Dye.

M. KESCHNER AND V. H. ROSEN (*Archives of Ophthalmology*, June, 1941) report the case of a woman, thirty-seven years of age, who complained of blurred vision for four weeks. She had bilateral papilloedema; tumour of the brain was diagnosed and operation advised. Later it was discovered that before her illness she had had her hair dyed a henna shade. Some stain on her forehead was removed by ammonia. Her sight improved and the papilloedema receded. The hair dye used was known as "Glo-Ruz"—a benzene ring derivative. The phenylenediamines exert their toxic effects either locally, as in the dermatoses, or on remote organs by direct absorption into the blood stream through the intact skin. Attempts to remove the dye from the hair or skin are considered dangerous. This may have been a factor in the present case.

The Use of Vitamin C (Ascorbic Acid) in Corneal Inflammations.

T. K. LYLE AND D. W. MCLEAN (*The British Journal of Ophthalmology*, June, 1941) treated a man, aged thirty-five years, who had had a dendritic ulcer for ten weeks. On ten successive days he was given an intravenous injection first of 250 milligrammes and then of 500 milligrammes of ascorbic acid. The progress was remarkable and followed the first injection. A second patient was treated similarly for deciform keratitis, and a third for scleritis with early sclerosing keratitis. Other conditions thus treated were superficial punctate keratitis, vaccinal keratitis and phlyctenular keratitis.

Streptothricosis of the Canaliculi.

A. J. ELLIOT (*American Journal of Ophthalmology*, June, 1941) reports nine cases of streptothricosis of the canaliculi. A resistant mass is felt over the canaliculus, usually the lower. The puncture may or may not be red and dilated. Many concretions may be expressed. Another type simulates a unilateral conjunctivitis with suppuration. Following the expression of the contents the duct may be irrigated through into the nose. Bacteriological findings confirm the diagnosis. All the patients were females and the majority were between the ages of forty-six and fifty-eight years. Treatment included expression and curettage, instillation of Lugol's iodine into the canaliculus, and the administration of potassium iodide by mouth.

OTO-RHINO-LAYNGOLOGY.

Ménière's Syndrome.

MILES ATKINSON (*The Journal of the American Medical Association*, April 19, 1941) divides cases of Ménière's syndrome into two principal groups, in accordance with an ætiological theory based on clinical observation and experiment. The author, while conceding that other factors may play a part in the ætiology of the attacks,

divides the cases into an allergic group and a vaso-constrictor group. Amongst the former may be cases due to specific allergens; however, a general allergy, as indicated by well-marked skin sensitivity to histamine, has been demonstrated in a large number of the cases. This test is exploited to distinguish the allergic group from the non-allergic or vaso-constrictor group, which show no reaction to histamine. The necessity for demonstration of a well-marked reaction to the intradermal histamine test, as evinced by a wide erythema, a large wheal and long pseudopodia, is stressed, since in the planning of treatment it is shown that the therapy required for the one group may aggravate the symptoms of the other. For the allergic group the avoidance of known specific allergens is obviously necessary. The author, however, employs a process of histamine desensitization and claims relief from symptoms in the allergic group by this method. For the vaso-constrictor group known vaso-dilators have been tried, each with some measure of success, both in overcoming the immediate symptoms and in the prevention of recurrences. Amyl nitrite vapour, acetylcholine injections, epinephrine, and finally nicotinic acid, alone or combined with varying proportions of thiamine hydrochloride, have each been tried with success. The author's plan is first to determine to which group the particular case belongs. While some discernible differences in the nature of the attacks and resultant effects upon hearing and production of tinnitus are recorded in the author's series of cases, the response to the histamine test is the final factor to be employed in classifying the cases into one of the two groups. Members of the allergic group give a positive cutaneous reaction with histamine. Those in the vaso-constrictor group do not react to the cutaneous test with histamine. Treatment of the allergic group calls for the discovery of, and removal from or desensitization against, specific allergens if possible. Non-specifically sensitive patients are treated by histamine desensitization. This is carried out by subcutaneous injections of histamine, a start being made with 0·01 milligramme and the dose being increased twice or three times a week up to one milligramme, or less if tolerance is reached earlier. A second short course after three months is advisable. For the vaso-constrictor group, after trying various known vaso-dilators, the author has achieved most satisfactory results with nicotinic acid combined with thiamine hydrochloride. The proportions are varied for younger and older groups of patients. Nicotinic acid, being the more rapidly acting and stronger vaso-dilator, is used in higher proportion for the young and middle-age groups, while for the older patients, who do not tolerate drastic vaso-dilatation so readily, a mixture of 50% nicotinic acid with thiamine hydrochloride is recommended. Nicotinic acid, nevertheless, is regarded as the more important of the two factors. The tolerated dosage is variable throughout all age groups. The principle is to push each patient to the limit of his tolerance, maintain the dosage there as long as necessary (a matter of months) and then gradually to diminish the dose to a maintenance dose, which may then be given orally. In general, the middle-aged class of patient requires and tolerates 50 milligrammes and more daily; the young may commence with 25 milligrammes, and this can be increased, while the old group will tolerate only 10 to 20 milligrammes a day. The dose scale of thiamine hydrochloride is more or less the reverse of the nicotinic acid, the proportion in a mixture for injection varying from 20% to 50% and even higher between the young and the older patients. While the period since institution of treatment has not been long enough for definite cures to be established, the results in both groups of cases are reported as highly satisfactory, and especially is this so with the allergic group.

Laryngofissure for Cancer of the Larynx.

CHEVALIER JACKSON (*Archives of Otolaryngology*, April, 1941) records observations on a series of fifty consecutive cases in which laryngofissure was undertaken for cancer of the larynx. The operation is performed under infiltration local anæsthesia. Skeletonization of the larynx is strictly avoided. After incision of the skin and areolar tissue in the mid-line, the cricothyreoid membrane is incised and a cocaine-impregnated sponge is passed into the larynx to reduce sensitivity of the interior. If the anterior commissure is suspected to be involved in the growth, the thyreoid cartilage is divided in the mid-line from its anterior surface with a knife or saw, and care is taken to avoid division of the underlying soft tissues. If the anterior commissure is free of growth, then the thyreoid cartilage may be divided with a shear or special scissors may be passed in through the opening previously made in the crico-thyreoid membrane. In this instance the soft tissues at the anterior commissure may also be incised accurately in the mid-line. An adequate block of tissue containing the tumour is removed after subperichondrial elevation off the cartilage. The author does not advocate removal of the thyreoid ala itself. Complete hæmostasis is essential before closure. Suturing omits the cartilage, and the wound is closed without drainage. Tracheotomy, as part of the operation, is considered unnecessary. In only two cases was this required in order to permit packing to control hæmorrhage. Natural swallowing of a full bolus is usually possible, tube feeding being unnecessary. The author avoids the use of opiates after operations on the respiratory tract, in order to guard against broncho-pulmonary complications. Occasionally after-care calls for the endoscopic removal of granulomata. A useful voice was preserved in all cases. In this series there was no operative mortality. In only five cases was there recurrence; 91% of the patients are reported as free of growth and well for one year and longer. Of 30 patients operated on over three years ago, 26 (86·6%) are well and free from recurrence.

Treatment of Carcinoma of the Bronchus.

F. C. ORMEROD (*The Journal of Laryngology and Otology*, January, 1941) records a further series of cases of carcinoma of the bronchus in which treatment has consisted in the application of radon. In all, in this and earlier publications, the author has now reported 100 cases of proven bronchial carcinoma. Of the whole series a number were considered too far advanced for any treatment to be of avail. In others, though the condition was advanced, treatment was undertaken merely with the object of opening up an obstructed bronchus and improving aeration of the lung, a procedure which prolongs life and greatly increases the patient's comfort and well-being. While the average expectation of life throughout the series has been advanced only slightly with treatment, encouragement to the surgeon has resulted from the very satisfactory results in certain individual cases. Thus, of the 100 patients, 21 have survived for over one year. Of these, one is still alive after two years, two after two and a half years, one after three years, one after four, one after five, and one after eight years. Another seven patients were considerably relieved of troublesome symptoms and survived from seven to twelve months. The technique in handling a case consists first of diagnostic bronchoscopy, biopsy examination and the use of X rays. Then follows the endoscopic insertion of radon. Sometimes, in order to improve the airway to the upper or middle lobe bronchi, a projecting portion of the growth may first be removed through the bronchoscope. The dose of radon has been progressively increased by the author, so that he now usually uses ten silver seeds, each of three millicuries, in each case. The seeds are inserted into and around the growth by means of a special introducer. Basal sedatives followed by local anæsthesia are used both for the bronchoscopy and for radon insertion. There is very little reaction after the radon insertion, the patients usually being able to return home after two or three days. Two months after the first radon application, the patient is admitted to hospital for a second similar treatment, and again, if necessary, a third application is made after an additional two months.

Sodium Morrhuate for Chronic Simple Vasomotor Rhinitis and Hypertrophic Forms of Rhinitis.

E. A. THACKER AND G. A. HAUSER (*Archives of Otolaryngology*, April, 1941), after reviewing the diversity of reagents and methods employed to produce shrinkage of chronically hyperturgid turbinates and to reduce hypersecretion and other symptoms associated therewith, record the results of treatment of 58 patients suffering from the condition by the submucous injection of 5% sodium morrhuate as a sclerosing agent. The procedure is carried out under topical local anæsthesia, a 2% solution of butyn sulphate or a 10% larocaine hydrochloride solution being used. Cocaine is avoided, also adrenaline and such-like tissue-shrinking drugs, as introduction of the needle is easier in the turgid tissues and penetration of the mucosa is less likely to occur. One side is treated at a time, about 0·5 cubic centimetre of the solution being injected along the needle track as the needle is slowly withdrawn from the inferior turbinate. The other side of the nose is treated about one week later and then after a further week the first-treated side may be injected again, a fortnight thus elapsing between repeated injections on the same side. The middle turbinates, if necessary, may also be injected, a curved needle being required for this purpose. There is little discomfort following these injections. Some congestion and mucous secretion may last for two or three days. To relieve this, shrinking drugs, such as ephedrine or "Neosynephrin", are used every two or three hours. No untoward effects were observed in any of the cases. Headaches, nasal dripping and other chronic nasal symptoms were greatly diminished or cured.

British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held on May 22, 1941, at the Royal Prince Alfred Hospital. The meeting took the form of a number of clinical demonstrations by members of the honorary staff of the hospital.

Aplastic Anæmia.

DR. T. M. GREENAWAY showed a boy suffering from anæmia. He said that he had no doubt that the condition was an aplastic or severely hypoplastic anæmia. The cause was not apparent, as was often the case in this disease. Earlier in the illness aleuchæmic leucosis was considered a likely diagnosis. It was true that in children and young people the disease commonly called leuchæmia was in fact aleuchæmic at its onset and for some months afterwards in a surprisingly large number of cases. It was unlikely, however, that the blood picture would remain that of an aleuchæmic condition for so long as four years. Aplastic anæmia, from some unknown cause, was now accepted as the diagnosis in the case of the boy under discussion. On one occasion a reticulocytosis of 6% had been present, indicating that the bone marrow was actively regenerating red cells. Unfortunately, however, that was but a temporary phase. The patient demonstrated the remarkable way in which it was possible to become adapted to a red cell deficiency, for with his erythrocytes numbering between 1,000,000 and 2,000,000 per cubic millimetre he walked about. At one time he actually obtained a job and was very disappointed when he lost it. He was being kept alive by repeated blood transfusions, in the hope that the factor depressing his bone marrow activity might in time cease to act and the boy be cured.

DR. R. S. STEEL showed a male patient, aged twenty-nine years, who complained of bleeding from the gums and nose of one month's duration, and of breathlessness on slight effort for a similar period. The breathlessness had increased, and dizziness, palpitation and tinnitus had been present for one week. Swelling of the feet occurred two days before his admission to hospital.

Physical examination revealed a well-nourished man, with pronounced pallor of the skin and mucous membranes. The sclerotics were bluish in colour. The liver and spleen were not palpable, and no enlarged lymph glands were present. There was slight œdema of the feet. A basal systolic murmur was detected in the heart, which was not enlarged. The blood count revealed a normocytic anæmia. The erythrocytes numbered 1,550,000 and the leucocytes 2,650 per cubic millimetre; 2% of the erythrocytes were reticulocytes, and the hæmoglobin value was 29%. The platelets numbered 90,000 per cubic millimetre. An X-ray examination of the lungs revealed no abnormality. No free hydrochloric acid was present in the fasting gastric juice.

Disseminated Sclerosis.

Dr. Greenaway also showed a patient suffering from disseminated sclerosis. He admitted some doubt as to whether his diagnosis was correct. The patient had too complete a picture of the disease, had developed it too quickly, and lacked a clear history of remissions. At the time of the meeting the patient exhibited slurred speech, an intention tremor, nystagmus and bilateral pyramidal involvement. It was possible that all these symptoms were caused by a bilateral bulbar lesion and not disseminated sclerosis at all. Shortly, perhaps, fibrillary twitching and wasting in the tongue might develop, indicating that the slurred speech was due to gradual destruction of the hypoglossal nucleus. If that happened, the diagnosis would probably become bulbar palsy. Until it did, disseminated sclerosis seemed to explain the clinical condition better than any other diagnosis.

Aortic Aneurysm.

Dr. Greenaway next showed a patient suffering from an aortic aneurysm. He said that his chief reason for showing the patient was the large size of the pulsating tumour in the chest wall produced by the aneurysm. Such tumours were not often seen at the present time. They occurred only after the aneurysm had eroded the bony thoracic cage. Pulsation in the anterior chest wall suggestive of aortic aneurysm, but without bone erosion or tumour formation, was much more common. Such pulsation might consist of a forward heave of the whole sternum during systole, or it might be seen only in the upper intercostal spaces, usually close to the sternum. In the latter situation in thin people a little retraction of the lung or a little augmentation of the heart's action might render a systolic pulsation visible in the absence of any dilatation of the aorta.

Mediastinal Obstruction.

Dr. Greenaway finally showed a male patient suffering from mediastinal obstruction. He said that the diagnosis was now a simple matter. The orthopnœa and persistent congestion of the face, neck and arms without pulsation in the engorged veins could hardly be due to anything else. It was not so simple, however, to state precisely the cause of the obstruction. Almost certainly it was a mass associated with the mediastinal lymph glands, perhaps lymphosarcoma, perhaps Hodgkin's disease. At one stage the area of opacity in the X-ray film had suggested an arterial aneurysm. The patient clearly exhibited d'Espine's sign, the dagger-shaped area over the thoracic vertebræ in which bronchial breathing, conducted by the mediastinal mass, could be heard. He was to be admitted to hospital for treatment by deep X rays, in the hope of relieving the symptoms of obstruction.

Tabes Dorsalis and Charcot's Joint.

Dr. Steel also showed a female patient, aged fifty-one years, who had suffered from nervousness for thirteen years, from weakness of both arms and legs for six years, from sharp shooting and stabbing pain in the limbs for five years, from difficulty in control of the bowels for four years, and from swelling of the right knee for seven months.

Examination revealed a tabetic gait; Romberg's sign was present, the pupils were unequal and the knee jerks were absent. In the region of the right knee obvious swelling and crepitus were present, but there was no pain on movement. The Lange gold curve was of normal type. Examination of the cerebro-spinal fluid revealed no abnormality. The Wassermann and Kline tests failed to produce reactions. An X-ray examination of the knee revealed no bony abnormality. In 1928 the Wassermann test had produced a reaction.

Facial Paralysis.

DR. T. M. FURBER showed a male patient, aged twenty-three years, who had been born before the doctor's arrival and suffered from facial paralysis from birth. This caused him great mental suffering from a feeling of inferiority, and so he was anxious to have something done to improve his appearance. Dr. Furber said that W. O. Lodge, in *The British Journal of Surgery* of January, 1930, described an operation in which he replaced by a strip of *fascia lata* the *orbicularis oris*, the *levator palpebræ superioris*, and *alæ nasi* and the *zygomaticus major*. Dr. Furber quoted the following passage from Lodge's article:

> Two short incisions are made exposing the temporal fascia and the internal palpebral ligament respectively. The latter structure—a familiar landmark in the operation of excision of the lachrymal sac—is invariably easily defined. A third tiny incision is made at the junction of skin and mucous membrane at the angle of the mouth. Meanwhile an assistant has been excising as long a strip of *fascia lata* as can possibly be obtained, 5 mm. in width from the outer aspect of the thigh; this is threaded along a triangular course between the three facial incisions among the atrophied muscles with the aid of a packing needle. The internal palpebral ligament and *orbicularis oris* are encircled *en route*. The free ends are drawn taut and woven into the fibres of the temporal fascia.

Dr. Furber said that the description was quite adequate; but he emphasized the necessity for obtaining as long a strip as possible. He found that it needed a great deal of force to push the packing needle through the cheek muscles, and he also found much difficulty in inserting the needle between the skin and bone just below the internal palpebral ligament. The result was excellent; when the patient's face was in repose the mouth was symmetrical and the ptosis of the lower lid had gone.

Multiple Myomectomy.

DR. M. BRITNELL FRASER showed a hysterogram of a uterus after multiple myomectomy. The patient was a *nullipara*, aged thirty-eight years, with fifteen fibroid growths varying in size from the largest, six inches in diameter, to the smallest, the size of a pea. They were removed by Bonney's technique, in which the anterior and posterior fibroids were removed, as far as practicable, from a single incision. Dr. Fraser mentioned an important point in technique, namely, the turning back of a good peritoneal flap, so that

the probability of the formation of omental adhesions was reduced to a minimum. The hysterogram showed a normal pyriform cavity, the outline of the tubes being clearly defined. Dr. Fraser emphasized the importance of thorough disinfection of the uterine cavity after curettage, because an opening was always made into the cavity in the removal of numerous fibroids.

Leucoplakia Vulvæ.

Dr. Fraser also showed a patient, aged forty-three years, on whom he had performed simple vulvectomy for *leucoplakia vulvæ*. The condition had developed subsequent to hysterectomy with removal of the ovaries four years before, and the application of deep X-ray therapy nine months before the meeting had caused a severe reaction, with redness and œdema of the vulva. The swelling had caused exacerbation of the pruritus. A wider excision of the skin than usual was necessary in this case, and coaptation of the wound edges was achieved by division of the deep fascia over the origin of the adductors of the thigh. The operation was performed under "Pentothal Sodium" anæsthesia induced by the continuous intravenous method.

DR. W. I. T. HOTTEN demonstrated the apparatus used with this type of anæsthesia.

Paraphyseal Cyst of the Third Ventricle.

DR. GILBERT PHILLIPS showed a patient who had had a paraphyseal cyst of the third ventricle. The patient had suffered from bifrontal headache for three months, intermittent in nature, occurring daily and diminishing in intensity towards the afternoon. Attacks of blurring of vision had occurred for three months, and the patient also noticed occasional flashes of light. Attacks of vomiting, usually occurring in the morning, had been present for three months.

On examination fairly advanced bilateral papilloedema was noticed. The systolic blood pressure was 148 millimetres of mercury and the diastolic pressure 102. The cerebro-spinal fluid pressure was 250 millimetres; the fluid contained normal amounts of globulin, protein and cells. An X-ray examination of the skull revealed a considerable increase in the convolutional markings. The *sella turcica* was small and smooth, and some erosion of the clinoid processes was present. A ventriculographic examination revealed greatly dilated lateral ventricles. No air passed from one side to the other through the foramen of Monro; this indicated a block at this situation. No air went into the third ventricle.

A left frontal osteoplastic craniotomy was performed and the left foramen of Monro was exposed through the left frontal lobe. A bluish cystic tumour was found occupying the anterior extremity of the third ventricle and obstructing the foramen of Monro. This was removed by dissection and suction. The patient made an uneventful recovery, and at the time of the meeting appeared perfectly well.

Radium and Radon Therapy.

DR. P. D. BRADDON showed a number of patients treated by radium and radon, and also gave demonstrations of methods of use of radon gold seeds and of various types of moulds for the treatment of lesions at a distance with homogeneous γ radiation. The first patient, a female, aged seventy-four years, had an extensive basal-celled carcinoma of both sides and the bridge of the nose, with destruction of the left *ala nasi* and adherence to bone and cartilage. She had experienced twenty-seven years of various forms of treatment, all of which had failed to check the slow but steady spread of the disease. When she was first seen seven months earlier she presented extensive growth and ulceration. She was treated by bilateral radon emanation moulds set up in an aluminium capsule to maintain exact spacing and strict parallelism between the moulds. The dosage was calculated for every 0·5 centimetre of depth right through all tissues from one side to the other, and was so arranged that the summated dose from the two fields was a minimum of 6,200 *r* over ten days. The eyes were sealed and protected by lead and rubber. The result was most gratifying; within three months the nose was completely healed and all signs of growth had disappeared. The patient's appearance, after many years of disfigurement, was restored almost to normal.

Dr. Braddon's second patient was a male, aged sixty-six years, who three years earlier had presented a large, foul, fungating carcinoma of the left side of the tongue and floor of the mouth, with enlarged submaxillary and upper deep cervical glands on the left side. Biopsy showed the growth to be a squamous-celled carcinoma. An interstitial radon implantation to give 6,500 *r* was carried out, as well as radical excision of glands. At the time of the meeting the patient had a soft, mobile tongue, with intact and apparently normal mucosa; this was more than three years after treatment. The neck was free from enlarged glands.

Dr. Braddon also showed a male patient, aged seventy-six years, who had suffered twelve months previously from an ulcerated growth (squamous-celled carcinoma) of the inner aspect of the left side of the jaw near the angle and extending up to the anterior pillar of the fauces. A radon gold seed implantation (permanent) had been carried out, but no excision of glands had been performed, partly owing to the patient's age and general condition, and partly because there was no clinical enlargement of cervical glands. Twelve months later, at the time of the meeting, the patient exhibited an excellent result, without scarring at the site of the original lesion; the neck had remained free from enlarged glands.

(To be continued.)

MEDICO-POLITICAL.

A MEETING of the Western Australian Branch of the British Medical Association was held at the Perth Hospital on June 18, 1941, DR. J. P. AINSLIE, the President, in the chair.

WING COMMANDER DAVIS, Principal Medical Officer of the Royal Australian Air Force, Western Australia, was present by invitation.

Medical Man Power in Western Australia.

SQUADRON-LEADER N. M. CUTHBERT, Deputy Chairman of the State Coordination Committee, presented an "Appreciation of Medical Man Power of Western Australia, with Special Reference to Economy of Personnel" (see page 293).

DR. SYME JOHNSON said that time should be allowed for more adequate study of the proposals embodied in the paper and that the resultant criticisms should be sent in writing to the Coordination Committee.

DR. J. P. AINSLIE suggested that, as the war had been in progress for nearly two years, members had had ample time to formulate suggestions and to develop grievances which would benefit by the resulting debate.

DR. J. H. YOUNG suggested that a circular letter be issued by the Branch along the lines laid out in a recent issue of THE MEDICAL JOURNAL OF AUSTRALIA regarding (*a*) unnecessary calls and the organizing of general practice, (*b*) the calling of a meeting of the out-patient honorary staff of the hospitals for the discussion of ways and means of improving their work with the staffs depleted as they were at present.

Dr. A. DALY SMITH instanced the waste of time seen on the goldfields, where workers were required to produce a medical certificate after two or three days' absence for minor ailments; doctors' rooms were crowded night after night with such people. In his opinion the companies concerned should be approached with a view to allowing absence for short periods without certification during the war.

DR. J. J. HOLLAND adduced the information that the figures applied only to the end of the year. In his opinion a much longer view should be taken and preparations made accordingly.

DR. L. A. HAYWARD congratulated Squadron-Leader Cuthbert for his enlightenment of what was a critical position. He thought that the specialists might be relieved of their overwork by the relegation of all but consultative work to the general practitioner whose case it was. The specialist would be available for occasional review should this be warranted—at long intervals; thus it might be found possible to spare another physician for active service. In hospitals both senior surgeons and physicians could be available for consultant service and be relieved of much of their present routine work. He regarded the general practitioners as the key men of the profession; their work was hard and prolonged; they would require to reorganize their practices by operating under a group system, in which any member of the group would be available for any patient residing in that area and calls be confined to those patients to the exclusion of calls from neighbouring suburbs. The saving of petrol had become a vital concern and every endeavour should be made to reduce consumption.

DR. M. K. MOSS desired to do away with the morning consulting hour and to secure the adoption of a metal disk for the front of motor cars, the presence of which would render the profession immune from prosecution for parking irregularities.

DR. H. J. C. HANRAHAN thought that the war would be a lengthy one; that Western Australia's quota was excellent

almost to the point of depletion; with more to go there would be a greater shortage for civilian service. They would not be making money, and he urged the immediate adoption of a scheme of national service applicable to Western Australia. There was a great tendency in government circles to socialistic experimentation; the profession should therefore get in before some such scheme was forced on it. He thought that the adoption of a salaried service might present advantages in the form of time off for recreation, study and rest.

DR. M. S. BELL instanced the waste of the general practitioner's time caused through accidents to which he was called; the injured were usually gone when he arrived on the scene. He thought that this and the shortage of doctors for trivial work should be made public through the Press.

DR. S. E. CRAIG advocated conscription—complete—of men and wealth; men could then be sent where they were most needed and there would be no wasted effort or overlapping.

DR. J. G. HISLOP advocated group partnerships, in which members would alternate between consulting and visiting; income from the partnership would be pooled and distributed between the partners.

DR. E. BYRON stressed the danger that would accrue after the war from the employment of alien practitioners in districts vacated by men on active service. An exaggerated idea of the alien's ability was held in the country. Dr. Byron deprecated their employment unless under very strict future control, which he regarded as difficult.

DR. F. W. CARTER quoted published remarks made recently by the Minister for Public Health, in which he had stated that the only solution of the difficulty lay in "nationalization of medical service" or "flooding the country with refugee doctors". In Dr. Carter's opinion, the former would accentuate the difficulty, while the latter would provide cheap labour in country districts to the exclusion of returned Australians.

DR. D. D. PATON quoted the recent amendments of the *Medical Act* of Western Australia to show that ample safeguards had been inserted whereby the interests of returned medical men would be protected; he was satisfied with the attitude taken by the Minister during negotiations that had taken place before their presentation to Parliament.

DR. J. P. AINSLIE, from the chair, explained the provisions of the act in detail.

DR. G. A. KELSALL considered that much of the routine clerical work in the Army might be done by laymen; much time was unnecessarily spent in such work.

DR. G. W. BARBER opposed the introduction of laymen into such military units as field ambulances; he thought that the Army was understaffed rather than overstaffed.

Dr. Ainslie supported Dr. Barber's remarks; he thought that the impression of overstaffing was calculated to breed discontent; the demand for men was justified.

COLONEL D. M. MCWHAE, Deputy Director of Medical Services, Fifth Military District, congratulated Squadron-Leader Cuthbert on his paper, which he thought was splendid; his action in bringing the matter up was praiseworthy. Papers issued in the past had been lost to the profession because of secrecy. He eulogized appreciations by Lieutenant-Colonel F. Clark and Major Hector Stewart, who had set a standard of high efficiency. The appreciation given that evening was the most exhaustive, for it went into details previously not touched on. Colonel McWhae made appreciative reference to the work that had been done by Mr. Neilson Hancock, the Secretary of the Coordination Committee, who had worked in close collaboration with Squadron-Leader Cuthbert.

Squadron-Leader Cuthbert replied to the remarks and suggestions of the various speakers.

Medical Societies.

MELBOURNE PÆDIATRIC SOCIETY.

A MEETING of the Melbourne Pædiatric Society was held on June 11, 1941, at the Children's Hospital, Melbourne, DR. H. L. STOKES, the President, in the chair. The meeting took the form of a series of clinical demonstrations by some of the members. Part of this report appeared in the issue of September 6, 1941.

Diaphragmatic Hernia with Microcytic Anæmia.

DR. MONA BLANCH showed a boy, aged fourteen years, who had been under treatment for a long time because of the persistence of microcytic anæmia, which became severe if he failed to attend hospital regularly for continuation of iron therapy. She said that in January, 1930, the boy had been admitted to the Children's Hospital for the first time on account of anorexia, anæmia and cough; though he had been receiving a good diet and had had no hæmorrhages, he was pale and the heart was enlarged, a systolic murmur was present, the liver was enlarged downwards, and from the radiographic appearances it was thought that some pneumonic consolidation was present at the base of the right lung. The red cells numbered 3,080,000 and the white cells 14,000 per cubic millimetre of blood; examination of a blood film revealed secondary anæmia, and 2% of the cells were primitive. After three weeks of feverishness the child became afebrile. The condition was regarded as an example of von Jaksch's anæmia, and while he was in hospital several small transfusions of blood were given.

After his discharge from hospital the boy attended Dr. Embelton's clinic in the out-patient department and came under the care of Dr. Blanch, who at first used a number of proprietary liver and stomach preparations; but in May, 1931, the hæmoglobin content was estimated at 40% and the red cells numbered only 2,520,000 per cubic millimetre. At that stage Dr. Blanch added *Pulvis Ferri Carbonatis Saccharati*, ten grains three times a day, with great benefit to the child, which lasted only as long as he took it; he appeared to be absolutely dependent on the iron. In November, 1931, it was decided to show him at a meeting of the society, and when further radiography of the chest was carried out, Dr. Colin Macdonald's report raised the interesting suspicion that right-sided diaphragmatic herniation of the stomach was present. Dr. Macdonald recognized in a curved shadow in the film the curved line which had been described in 1910 by Dietlin and Knierin as characteristic of right-sided hernia. Further radiography of the stomach after a barium meal revealed that a considerable volume of the upper portion of the stomach passed through the œsophageal orifice into the right side of the thorax posteriorly.

In February, 1932, when the boy was admitted to hospital for operation, another radiographic investigation was made; this revealed that the herniation had increased. The whole stomach then lay in the right hemithorax posteriorly, the duodenum being displaced and the pylorus in a position corresponding with the normal œsophageal opening in the diaphragm. The stomach was inverted and the greater curvature was the higher in the thorax. A biochemical examination of a sample of the contents of the stomach withdrawn one and a half hours after a test meal showed 14% of free hydrochloric acid and 29% total acidity. When Dr. Hennessy performed œsophagoscopy he was unable to detect any abnormality.

On March 24, 1932, Dr. Charles Osborn operated on the boy. He removed five inches of the seventh rib on the right side and found that the stomach filled a hernial sac the size of a very large orange. It was not adherent and was reducible, but persistently returned to the sac. Dr. Osborn tied a cannula into the stomach; but at that stage the child's condition was not good, and without further attempt at reduction the wound was closed in layers. On April 13, 1932, Dr. Osborn operated again, but used the abdominal route. The hernia was found to pass through an opening one inch in diameter behind the œsophagus. There was difficulty in reducing it owing to strong suction and the presence of adhesions, the result of the earlier operation. The opening was closed with two sutures of chromicized catgut without the occurrence of an œsophageal stricture, and the fundus of the stomach was attached to the undersurface of the diaphragm. Dr. Blanch went on to say that ten days later it was seen from the skiagrams that the hernia had recurred.

From May, 1932, to May, 1940, the boy had appeared frequently in the out-patient department, and the hæmoglobin content of the blood had varied from 96% to 64% while he was taking iron fairly regularly; but in June, 1933, after he had failed to attend for eight months, the hæmoglobin value had dropped to 20% and the number of red cells to 1,810,000 per cubic millimetre. After he had taken *Ferri et Ammonii Citras*, 15 grains three times a day for five weeks, the hæmoglobin value rose to 96%. That medication was continued until March, 1935, and he again appeared very pale in June. He was given six pills a day, each of five grains of Blaud's pill (soft mass), with good effect until April, 1937, when, as he seemed to be very well, treatment was discontinued until November, 1938; at that time the hæmoglobin value was only 48%. He was given another iron preparation; but he did not seem able to absorb it, and the hæmoglobin value of the blood was not materially improved and fell to 37% in March, 1939, although then the

number of red cells was over 4,000,000 per cubic millimetre. *Ferri et Ammonii Citras*, 15 grains three times a day, was used again, and the hæmoglobin value rose to 63% in two months. In addition to the iron, dilute hydrochloric acid, 20 minims, was given with the meals until March, 1940.

In May, 1940, the hæmoglobin value was only 44%, and as the boy was aged thirteen years and genital and physical development was unsatisfactory, a little thyreoid medication was added; the iron preparation was changed to *Ferri Sulphas*, six grains a day in solution, with a little copper. Some improvement followed; but at times he vomited and the microcytic anæmia was not entirely relieved.

In February, 1941, the hæmoglobin value was 40%, and it was ascertained that the patient was working as a page boy, being indoors most of the day. He returned to hospital in May, 1941, looking blanched and weak, and as the hæmoglobin value had fallen to 25% and the number of red cells was only 2,600,000 per cubic millimetre, a transfusion of blood was given by the "drip" method until he had received 18·5 ounces. Biochemical investigation of the stomach contents after a test meal showed that the free hydrochloric acid and the total acidity were within normal limits. On June 10 the hæmoglobin value had risen to 55% and the number of red cells to 4,800,000 per cubic millimetre. At that time, by means of an opaque meal it could be seen in the skiagrams that though most of the stomach was below the diaphragm, a considerable portion of it was in the right side of the chest. Dr. Blanch added that it was of interest clinically to listen to the gurgling noise which was audible posteriorly over the right part of the thorax. She also said that she could not understand why iron deficiency should be so troublesome in spite of the plentiful presence of hydrochloric acid in the stomach, and though she could not explain it, it appeared to her that the child would have to take iron preparations always to maintain reasonably good health.

Dr. Blanch then said that the clinical history of the boy she had shown was a rare one and that she had studied the literature of diaphragmatic hernia for information about the associated anæmia. She was interested to find that, in an article published in *The American Journal of Surgery* in April and June, 1940, based on 68 children under the age of ten years, anæmia was not mentioned in the summary, but that one of the patients was described as anæmic, and that patient turned out to be the boy she had shown that night. In an article in *The Lancet* of January, 1940, dealing with two children, it was stated that both were grossly anæmic and were treated for that state initially, diaphragmatic hernia being found incidentally, as in the case under discussion; but neither of those patients had continued to need iron. The continued need was suggestive of occult leakage of blood; but the anæmia had been more a lack of hæmoglobin than of red blood cells, and a failure to absorb iron from food appeared to be present. Another theory that might be put forward was that the intrinsic factor of Castle was not functioning; but that was untenable, as the anæmia was microcytic and not macrocytic. Finally, Dr. Blanch asked for expressions of opinion as to whether any glandular treatment would be likely to be of help to the patient.

Dr. Whitaker said that he remembered that Dr. Stephens had had in his care at the hospital a patient with diaphragmatic hernia and anæmia, and that he had himself performed gastroscopy on a patient with a thoracic stomach, the hæmoglobin value of whose blood was 25%; he had recovered from that stomach material containing "coffee grounds" and had raised with Dr. Stephens the question as to whether hæmorrhagic oozing had occurred, as in Meckel's diverticulum.

Dr. Stephens, after expressing his keen interest in the case that Dr. Blanch had described, said that he remembered a child with a short œsophagus who had actually vomited blood. He could not understand why patients with right-sided or left-sided paraœsophageal diaphragmatic hernia should be anæmic, and he gave an account of a number of extraordinary experiences with thoracic stomachs and other misplaced viscera, including the spleen. He said that in the paraœsophageal type a sac was always present. In one family he had treated two members by operation. In each case the anomaly was right-sided and the approach was easy from the front; on each occasion the patient died. His opinion was that the surgical approach from the front was easy as a rule, but there were cases in which success could be obtained only through rib resection, especially when the lesion was on the left side.

DR. JOHN COLEBATCH considered the case a most interesting example of the mechanism of the production of a microcytic anæmia; the iron deficiency was due to a lack of balance between the demand on one hand and the supply and absorption on the other. There was mechanical interference with absorption, and the circulation in part of the stomach would be interfered with to a varying extent from time to time. It should not be forgotten, however, that an increased demand for iron could be due to chronic hæmorrhage, and that the resulting anæmia through the wastage of the patient's store of iron might be microcytic. Dr. Colebatch then suggested the advisability of overhauling the dietary details in an attempt to increase the intake of meat, egg, wholemeal bread and leafy vegetables. It was probable that the intrinsic factor was also deficient, as the boy was considerably undersized. Deficient absorption, intermittent hæmorrhages and faulty dietary seemed to him to be enough to explain the persistent anæmia.

Dr. Keith Hallam expressed his interest in the case and thanked Dr. Blanch for bringing the matter so ably before the members. He thought that congratulations were due also to Dr. Osborn for what must be regarded as an excellent result of the operative treatment. Dr. Hallam thought that it was suggestive from the X-ray films that the liver was somewhat enlarged. Perhaps some other deformity of the gastro-intestinal tract might be present; it might be of interest to make a complete opaque meal investigation of the alimentary canal. He went on to say that in a consideration of the varieties of diaphragmatic hernia the main point of importance from the radiological aspect was the decision as to whereabouts the œsophagus entered the stomach. It was often difficult to decide between diaphragmatic herniation and the presence of a shortened œsophagus with portion of the stomach above the level of the diaphragm. Finally, Dr. Hallam recommended that all who had not done so should read the excellent article on the subject by Sir Thomas Dunhill in *The British Journal of Surgery* of February, 1935; it was a classic of modern surgical literature.

DR. HENRY SINN expressed agreement with Dr. Colebatch's views. He said there was some physiological deficiency broadly comparable with the case of malplaced testis. Malposition was the important thing, and iron absorption had suffered; while the malposition continued, iron would have to be given. He commented on the value of the reticulocyte response to iron in the assessment of the result of treatment. The so-called "idiopathic" microcytic hypochromic anæmias might be due to the continued occurrence of bleeding somewhere.

Dr. Blanch, in reply, thanked those who had contributed to the discussion and said that she would certainly look for occult blood in the boy's stools. She admitted that his dietary was not good at present, and that as his mother had died a few years earlier the matter might not have received sufficient attention. It had been observed clinically that the liver was usually somewhat enlarged, and the lower edge might at times have been as much as five centimetres below the margin of the ribs; but the spleen had at no time been palpable.

Public Health.

"BRITAIN KEEPS FIT."

THE Industrial Publicity Unit of the Department of Overseas Trade in Great Britain has forwarded a short statement entitled "Britain Keeps Fit: The Nation's Health after the 'Blitz'". It has been prepared specially for publication in this journal.

Medical authorities in Britain are everywhere expressing astonishment at the robust state of health shown by the inhabitants of the "island fortress". After a winter of crowding in air-raid shelters, exposure by day and night in all weathers on A.R.P. and fire-watching duties and subjection to a nervous tension unparalleled in history, not only have prophecies of epidemics and lowered vitality been confounded, but the nation's health is in many respects better than it has been for years past.

In the first place, the winter has made quite a favourable showing in regard to the general incidence of disease. A review made by the Ministry of Health reveals that cases of scarlet fever in 1940 were fewer than in any year for the last ten years, while the number of diphtheria cases was the second lowest in this period, being 6,000 below the average. As regards influenza, the peak period has now been passed, and the total number of deaths in London and the 126 great towns up to April 12 was less than half the corresponding figure for 1940 (2,336 against 4,742). Measles remained fairly constant, and whooping cough showed a slight rise. Pneumonia, like influenza, was well down on last winter. There were only ten deaths from typhoid fever

in the first fourteen weeks of this year, compared with eleven in the same period of 1940.

The only disease with a large increase was cerebro-spinal fever (meningitis), which was more prevalent even than in the previous record year of 1915. Incidence in the services, however, was much less than a quarter of a century ago, there being one-third of the total in 1915 and only one-seventh in 1940. Moreover, the figures are steadily declining week by week—returns for the four weeks of March were 434, 400, 370 and 330—and it must be remembered that this disease never declines below a certain residuum—in 1940 it was one hundred cases a week.

What are the reasons for the comparatively healthy state of the Kingdom under such trying conditions as those of last winter? For a full answer it will be necessary to await the findings of a Ministry of Health committee of epidemiologists who are making a special inquiry in the London shelters. Nevertheless, some interesting conclusions may be drawn from a brief review of events since the "blitz" opened in the autumn.

It will be recalled that in the beginning there was some agitation for deep bomb-proof shelters. The Government, however, realizing the enormous technical difficulties of providing these in time for effective use, had decided before the war that the best policy was dispersal of the population. Evacuation of women and children from densely populated areas was encouraged and assisted, and for those unable to leave the big towns the local authorities provided family steel shelters, communal shelters, street surface shelters and compulsory refuges for all new buildings.

But as the "blitz" intensified, many thousands of people crowded into the deep underground railway stations, warehouses, and tunnels, which were not intended to be used as shelters and were not equipped to accommodate a large number of people for long periods. And as the dark days brought the rains, fog and snow of Britain's winter months, these people queued up for hours each day, sometimes from early in the forenoon, clutching bundles of bedding. When, in the late afternoon, they reached their haven, it was to be crowded together in conditions which were inevitably uncomfortable and insanitary. Everything, in fact, pointed to a plethora of epidemics such as had never been known before.

Presented with a *fait accompli*, there was, inevitably, some confusion among the various authorities, and during this period the initiative taken in particular by the underground railway staff to improvise sanitation for the invaders of their properties showed a public spirit which has not been sufficiently praised. The Government appointed a special committee under Lord Horder, which endorsed the policy of dispersal, but recommended immediate improvements in the provisions for health and comfort in all types of shelters. Many basements in large buildings were requisitioned and equipped as shelters. Bunks were provided not only in the underground stations and large shelters, but also in the family shelters, comprehensive sanitary arrangements introduced, ventilation and lighting improved, coal stoves installed in the surface shelters, and medical aid posts instituted in all large shelters. In January the Ministry of Health became responsible for the interior management of shelters.

As has already been stated, there were no "shelter diseases" as such, and no outbreak in any shelter, and the community as a whole remained remarkably healthy. What are the conclusions to be drawn?

In an admirable survey of the situation, read before the Royal Society of Arts recently, Lord Horder has suggested, among other things, that rough and ready as some of the improvisations were, shelter conditions may in many cases have been better than those of the people's own homes.

Sir Wilson Jameson, Chief Medical Officer to the Ministry of Health, has proposed other possible factors. With children's diseases, he says, dispersal must be considered a main safeguard. It is true that measles occurs even in the most remote country districts; but it is noticeable that where children are evacuated from tenement life to housing estate conditions, the disease, though still present, becomes a school disease, whereas in tenement areas it affects children of pre-school age, when the malady is most fatal.

With regard to shelter conditions, Sir Wilson Jameson points out that even there families tend to group themselves, thus exchanging only their own family germs.

A factor which has no doubt had due weight is the policy of the Ministry of Health of providing increased health education. An advertising campaign has been instituted, consisting of the unwearying repetition of simple rules for the avoidance of infection, posters and leaflets have been distributed in the shelters, and there is already evidence that these are forming good habits and eradicating bad ones. The importance of ventilation, exercise, dispersal and adequate sleep is being stressed.

An important part has also been played by the emergency Public Health Laboratories set up to meet war conditions, for these have resulted in a much earlier notification of the outbreak of disease, for example, in institutions. Doctors and nurses in the shelters have been able to diagnose infectious cases quickly and have them removed to hospital.

But there is no doubt that there are factors in the situation not directly connected with medical science. Among his other suggestions, Sir Wilson Jameson mentioned that people were not going to the cinema as frequently, nor congregating in other ways as they did in peacetime. There is no doubt that the spread of infection has been much reduced in this way. Then, too, there are an incalculable number of office workers who have of their own accord moved to temporary quarters in the country or on the outskirts of the large towns. There they live more or less the life of the countryman, rising early to catch their trains and going to bed at a correspondingly early hour. "Digging for victory" in gardens old and new has no doubt induced health by the exercise it provides, as well as by making fresh vegetables available to the household.

Lastly, there is the psychological effect of the "blitz" itself. Those who live dangerously have no time to brood over ailments, and when sudden death may fall on them at any moment there is no inducement to lie defenceless on a bed of sickness.

But, whatever the reasons for Britain's excellent state of health, there is no doubt that when the full story of the war is written, this will be one of its most interesting chapters. At the present time, to a nation faced with the most critical six months of its history, it may well be a decisive factor in the situation.

Correspondence.

A NATIONAL MEDICAL SERVICE.

SIR: It is rather appropriate that in the last two issues of the journal should appear articles on certain sociological problems in the production of disease, together with the report of the National Health and Medical Research Council embodying proposals for a nationalized medical service. The correspondence and writing devoted recently in our journals to the solution of these two major problems has been voluminous, and I only wish to add a few words on certain aspects which to me have not been adequately stressed.

Nationalization affects doctor and patient. The doctor must receive an adequate financial living and not unnaturally most of the discussion has centred round this factor. But of equal or more importance is the necessity for the doctor to have sufficient time to apply his knowledge to the solution of each patient's problem. The insistence on this point is one of the most vital statements in the above report and should ever be to the forefront in any discussion on this subject. Till now most paid medical services have suffered because of their inability to provide for this necessity as well as not allowing the doctor the opportunity to receive further post-graduate study from time to time.

In a nationalized medical scheme the patient is mainly concerned in getting the best medical attention. Yet in the large number of schemes put forward, how few have been based on the medical needs of the community, especially of those needs arising from sociological causes. Some of these problems, as nutrition and housing, have been partially investigated. So I believe it is only by an actual survey of the causes of sickness and their proportion that a service of any real value can be formulated. The Medical Research Council could then substantiate more adequately its policy were it to allow a band of medical investigators well versed in all branches of medicine and aided by trained social workers to investigate samples of population, drawn from hospitals and apparently healthy groups. This investigation would show in what proportion the various branches of medicine are needed in practice. Also these investigations would accurately ascertain the part played by the different economic problems, as diet, housing, recreation and work, in disease.

These factors are so obvious when we see the rapid improvement in health of apparently A class men when they enter military camps. So too, although by wireless we are beseeched to buy such fruits as apples to help the war effort, yet their scarcity and price make their purchase very difficult. There would indeed be many unpaid bills if one abided by the old maxim: "An apple a day . . ."

Then, too, when politicians concerned with the nation's health say we must nationalize medical services to improve

the people's lot, we would be able to say that if that is their main concern, then it would be more effectively dealt with if the above sociological problems were first remedied. If medicine is to be nationalized, as indeed it must, this move should be preceded or at least concurrently introduced with the nationalization of other services which produce considerably more illness in our community.

Yours, etc.,

N. V. YOUNGMAN.

Brisbane Clinic,
Wickham Terrace,
Brisbane.
August 22, 1941.

SIR: There has lately been much talk in the Press and over the radio with reference to nationalization of the medical profession, and we are told that the Government "has a scheme". As far as can be judged, the rank and file of the profession, who will be expected to work any such scheme, have so far not been consulted. Are we to have another *National Insurance Act* sprung upon us? If so, it is high time that the Federal and Branch Councils let us know a great deal about it. We are also told that the profession as a body is apathetic, but is this not in large measure the fault of the councils? Should it not be their duty to keep us informed of what is going on? It is difficult for individuals to do much, therefore we look to our elected representatives to give us a lead.

Might I suggest that committees be formed in each State to deal with this matter, these committees to be fully representative of those members of the profession who will be included in any such scheme of national medical service. It should further be the duty of these committees to set up any necessary sub-committees or groups to formulate a plan or plans acceptable to the majority of the profession, and thus when the time comes we will be able to move as a united body. But now is the time to act, not next month or next year. Or are the councils going to allow the same old drift and complacency to continue?

Yours, etc.,

R. H. OXBY DONALD.

Castlemaine,
Victoria,
August 30, 1941.

CHANGES IN THE LUNGS IN VARIOUS INDUSTRIES.

SIR: In answer to Dr. Badham's letter published in the journal of August 30, I would refer him to the most recent work published on the subject—"An Atlas of Silicosis", by Amor.

This appeared after my address was written, and it will probably displease Dr. Badham, as it bears out, almost word for word, the opinions published in my address. The book summarizes the findings of a man with practical as opposed to theoretical experience.

I was surprised, knowing Dr. Badham so well, that he agreed with me on the subjects of emphysema and radiological interpretation. This is quite an unusual event.

In conclusion, when Dr. Badham speaks on this subject I am always reminded of the old lady in *Punch*, who remarked when she saw the regiment pass: "Look, they're all out of step except our Willie."

Yours, etc.,

J. G. EDWARDS.

Craignish,
185, Macquarie Street,
Sydney.
August 29, 1941.

Naval, Military and Air Force.

APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 173, of August 28, 1941.

AUSTRALIAN IMPERIAL FORCE.

Australian Army Medical Corps.

To be Majors.—Major A. R. Home, Captain B. W. Nairn, Honorary Captains B. L. W. Clarke, R. G. Orr and S. Krantz and Geoffrey Francis Seymour Davies, 1st August, 1941.

To be Captains.—Captains S. G. Bradfield, 1st July, 1941, and D. N. Gillies, 21st July, 1941, and Honorary Captains J. H. Colebatch, 1st July, 1941, C. R. R. Huxtable, M.C., T. G. H. Hogg, G. A. Thompson and V. A. Conlon, 1st August, 1941.

To be Captains.—Captains R. S. Bennett, 1st August, 1941, I. A. M. Le Souef, 21st July, 1941, and R. P. Carew-Smyth, 1st August, 1941, and Honorary Captains R. Hertzberg, 21st July, 1941, and N. Joseph and H. H. McLennan, 1st August, 1941.

Captain J. L. Frew is transferred from Reinforcements, 1st August, 1941.

To be Major (temporarily).—Captain A. H. London, 1st June, 1941.

Captain P. C. Thomas is transferred from the Regimental Supernumerary List, 3rd June, 1941.

Permanent Supernumerary List.

Lieutenant-Colonel H. Bullock, Major A. W. L. Row and Captain F. W. Hammond are transferred from the Australian Army Medical Corps, 12th July, 1941.

AUSTRALIAN MILITARY FORCES.

AUSTRALIAN ARMY MEDICAL CORPS.

Northern Command.

First Military District.

Honorary Captain R. Hertzberg is appointed from the Reserve of Officers (A.A.M.C.) and to be Captain (provisionally), 20th July, 1941.

To be Honorary Captains.—Leslie Wohlgemuth Gall, 21st July, 1941; Matthew John Eakin and John Bertram Gilchrist Gibson, 28th July, 1941.

Eastern Command.

Second Military District.

The following officers are appointed from the Reserve of Officers (A.A.M.C.): Major (now Temporary Lieutenant-Colonel) W. Evans, M.C., 15th May, 1940, and is seconded, 21st May, 1940; and Honorary Captain C. G. Crawford, and to be Captain (provisionally), 29th July, 1941.

Major (Temporary Lieutenant-Colonel) W. Evans, M.C., is appointed an Assistant Director-General of Medical Services at the Headquarters of Medical Services at Army Headquarters, 21st May, 1940, and is granted the temporary rank of Colonel, 11th July, 1941.

The date of appointment from the Reserve of Officers (A.A.M.C.) of Major (now Temporary Lieutenant-Colonel) N78718 N. M. Gibson, O.B.E., which appeared in Executive Minute No. 55/1941, promulgated in *Commonwealth Gazette* No. 55 of 1941, is amended to read "17th September, 1940".

The resignation of Captain (provisionally) W. C. Holley of his commission is accepted, 10th June, 1940.

Captain (Temporary Major) S. D. Meares is appointed to command a Cavalry Field Ambulance, 4th July, 1941.

To be Captain (provisionally).—N273858 Benjamin Short, 25th July, 1941.

The notification respecting the appointment of Honorary Captain H. B. Gatenby, which appeared in Executive Minute No. 111/1941, promulgated in *Commonwealth Gazette* No. 124 of 1941, is cancelled.

To be Honorary Captains.—Eric Douglas Hull, 24th July, 1941; Stuart Douglas Allen, Francis John McEncroe and Carl Hermann Jaede, 25th July, 1941.

Southern Command.

Third Military District.

Major (Honorary Lieutenant-Colonel) H. H. Turnbull is appointed from the Reserve of Officers (A.A.M.C.), and is seconded and is appointed Consulting Physician at Army Headquarters and to be Colonel (temporarily), 11th July, 1941.

Captain (Temporary Lieutenant-Colonel) M. J. Holmes, D.S.O., is seconded, 1st June, 1940, and to be Colonel (temporarily), 11th July, 1941.

To be Honorary Captain.—Margaret Mary Henderson, 1st August, 1941.

Fourth Military District.

To be Honorary Captain.—Owen Wheatley Bowering, 29th July, 1941.

Western Command.

Fifth Military District.

Major L. A. Hayward is appointed from the Reserve of Officers (A.A.M.C.), 18th July, 1941.

Honorary Captain J. F. F. Drew is appointed from the Reserve of Officers (A.A.M.C.), 25th July, 1941.

To be Captain (provisionally).—Thomas Miles Gilbert, 31st July, 1941.

To be Honorary Captain.—Patrick William Shanahan, 23rd December, 1939 (in lieu of the notification respecting Percival William Shanahan, which appeared in Executive Minute No. 19/1940, promulgated in *Commonwealth Gazette* No. 17 of 1940).

CASUALTIES.

ACCORDING to the casualty list received on September 8, 1941, Major S. Plowman, A.A.M.C., of Frankston, Victoria, is reported wounded in action and remaining on duty.

MEDICAL WAR RELIEF FUND.

THE following is a sixteenth list of contributions to the Medical War Relief Fund established by the Federal Council of the British Medical Association in Australia for the relief of distressed medical practitioners in Great Britain.

Victoria.

£21: Dr. Thomas F. Ryan.
£20: Dr. H. C. Lloyd.
£10 10s.: Dr. John F. Williams, Dr. E. E. Price.
£5 5s.: Dr. A. J. Carroll, Dr. F. J. Colahan, Dr. R. B. Loosli, Dr. Leonard J. Mitchell.
£5: Dr. N. M. Harry.
£2 2s.: Dr. Rae W. Dungan, Dr. G. A. Penington, Dr. A. Saleeba.
£1 1s.: Dr. A. Deery, Dr. H. I. Gibb, Dr. D. F. O'Brien.

Western Australia.

£2 2s.: Dr. L. A. Musso.

Obituary.

HENRY WILLIAM HACKETT.

WE regret to announce the death of Dr. Henry William Hackett, which occurred on August 31, 1941, at Brisbane, Queensland.

MILLICE CULPIN.

WE regret to announce the death of Dr. Millice Culpin, which occurred on September 1, 1941, at Taringa, Queensland.

SAMUEL PERCIVAL LYTTLE.

WE regret to announce the death of Dr. Samuel Percival Lyttle, which occurred on September 5, 1941, at Goulburn, New South Wales.

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Baret, Henri Victor David, M.B., B.S., 1940 (Univ. Sydney), Prince Henry Hospital, Little Bay.
Fox, Walter Raymond Fancourt, M.B., 1939 (Univ. Sydney), 20, First Avenue, Five Dock.

Medical Appointments.

Dr. Alan Hamilton Millikan, pursuant to the provisions of the *Workers' Compensation Acts*, Victoria, has been appointed a Certifying Medical Practitioner and a Medical Referee at Casterton, Victoria.

Dr. Thomas Reeve Mathewson, pursuant to the provisions of *The Public Service Acts*, 1922 to 1924, *The Maternity Act of* 1922, and *The Charitable Institutions Management Act of* 1885, of Queensland, been appointed Director of Maternal and Child Welfare and Medical Officer, Diamantina Hospital, Brisbane, Queensland.

Sir Robert Wade, pursuant to the *Prince Henry Hospital Act*, 1936, of New South Wales, has been appointed a Director of the Prince Henry Hospital, Sydney, New South Wales.

Books Received.

"A Diabetic Manual for the Mutual Use of Doctor and Patient", by E. P. Joslin, M.D., Sc.D.; Seventh Edition; 1941. Philadelphia: Lea and Febiger. Sydney: Angus and Robertson Limited. Large crown 8vo, pp. 238, with illustrations and diagrams. Price: 16s. net.

Diary for the Month.

SEPT. 15.—Victorian Branch, B.M.A.: Hospital Subcommittee.
SEPT. 16.—New South Wales Branch, B.M.A.: Ethics Committee.
SEPT. 16.—Victorian Branch, B.M.A.: Organization Subcommittee.
SEPT. 16.—Victorian Branch, B.M.A.: Finance, House and Library Committee.
SEPT. 17.—Western Australian Branch, B.M.A.: Branch.
SEPT. 18.—New South Wales Branch, B.M.A.: Clinical.
SEPT. 18.—Victorian Branch, B.M.A.: Executive.
SEPT. 23.—New South Wales Branch, B.M.A.: Medical Politics Committee.
SEPT. 24.—Victorian Branch, B.M.A.: Council.
SEPT. 25.—South Australian Branch, B.M.A.: Branch.
SEPT. 25.—New South Wales Branch, B.M.A.: Branch.
SEPT. 26.—Tasmanian Branch, B.M.A.: Council.
SEPT. 26.—Queensland Branch, B.M.A.: Council.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phœnix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such a notification is received within one month.

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £2 for Australia and £2 5s. abroad *per annum* payable in advance.